

2015 개도국 식량안보를 위한 농정성과 확산(KAPEX) 사업 파라과이 공동조사 결과보고서

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Part I

Results of the Joint Research
by Paraguay Research Team

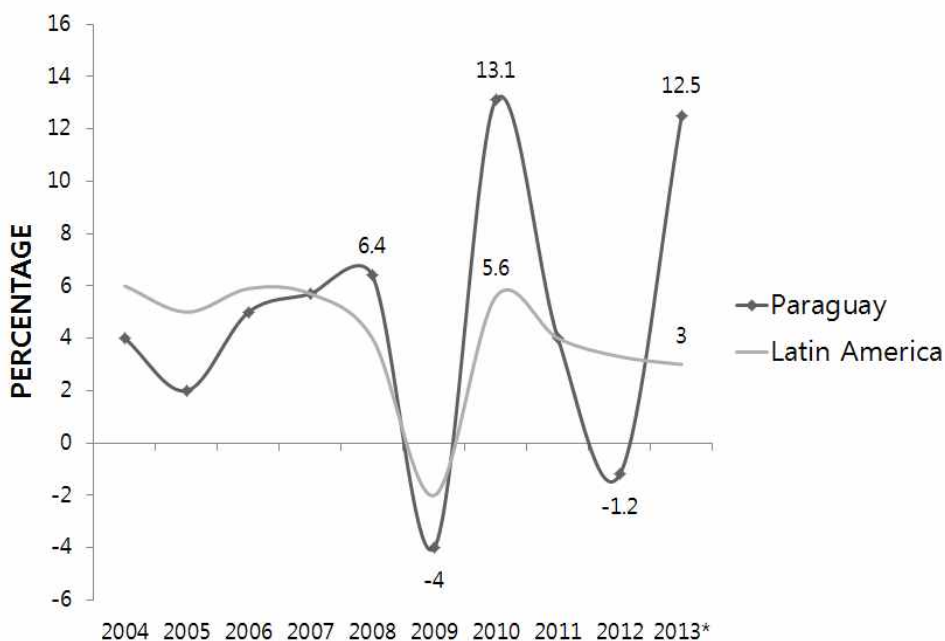
Chapter 1

Analysis about the Agricultural Sector in Paraguay

The Gross Domestic Product (GDP) at the end of 2009, recorded a fall of 3.8% compared to 2008; thereby interrupting the continuous growth of the Paraguayan economy during the previous six years (2003-2008), the annual average was 3.3%, at constant prices of 1994, during this period Paraguay experienced the longest economic expansion since 1970, which contributed to the decline in overall poverty levels, from 49.7% in 2002 to 37.9% in 2008.

The GDP growth was 4.3% in 2006, increased to 6.8% in 2007; but with the onset of the global economic crisis, in 2008, the rate of economic growth dropped to 5.8%, a trend that was accentuated by the contraction of the economy in 2009. The highest levels of growth in 2006-08 were the result of increased domestic demand, but mainly the growth of agricultural production which averaged 7% per year between 2003 and 2007. On the other hand, beef production also grew by 6% average annual during this same period.

Figure 1-1. GDP Growth in Paraguay and Latin America 2004-2013



Source: Elaboracion propia en base a datos de la CEPAL

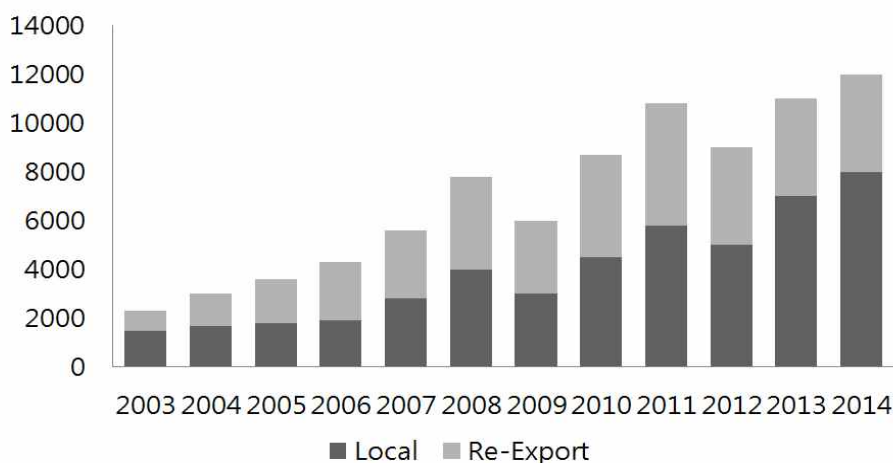
The GDP growth was 4.3% in 2006, increased to 6.8% in 2007; but with the onset of the global economic crisis, in 2008, the rate of economic growth dropped to 5.8%, a trend that was accentuated by the contraction of the economy in 2009. The highest levels of growth in 2006-08 were the result of increased domestic demand, but mainly the growth of agricultural production which averaged 7% per year between 2003 and 2007. On the other hand, beef production also grew by 6% average annually during the same period.

The contraction of the economy in 2009 was a result of the slowdown in domestic demand, corresponding to the components of consumption and investment. Moreover the productive activity was affected by the sharp di-

minution of 23.8% in agricultural sector, partly a consequence of adverse weather conditions.

Much of the Latin American economic boom of the 2000s is explained by a significant increase in international prices of commodities, be they agricultural (food) or minerals. Vigorous growth in emerging economies, especially China, then produced a significant increase in demand for those products. Paraguay has not been absent from this cycle. The numbers show that as of 2004, exports rose from US \$ 1,500 million to about US \$ 7.600 million estimated for late 2014 (Data from OBEI). But the country's total exports not only comprise of originating products, also include re-exports (trade triangulation Asian products to neighboring countries), as shown in the following CHART No. 2. In 2014 the country's exports would reach more than US \$ 11,600 million, being composed by 65% for goods originating (US \$ 7,600 million) and 35% for re-export products (US \$ 4.015 million).

Figure 1-2. Paraguay: Evolution of the Total Exports (In Million USD)



SOURCE: BCP - OBEI 2014. FERNANDO MASI.

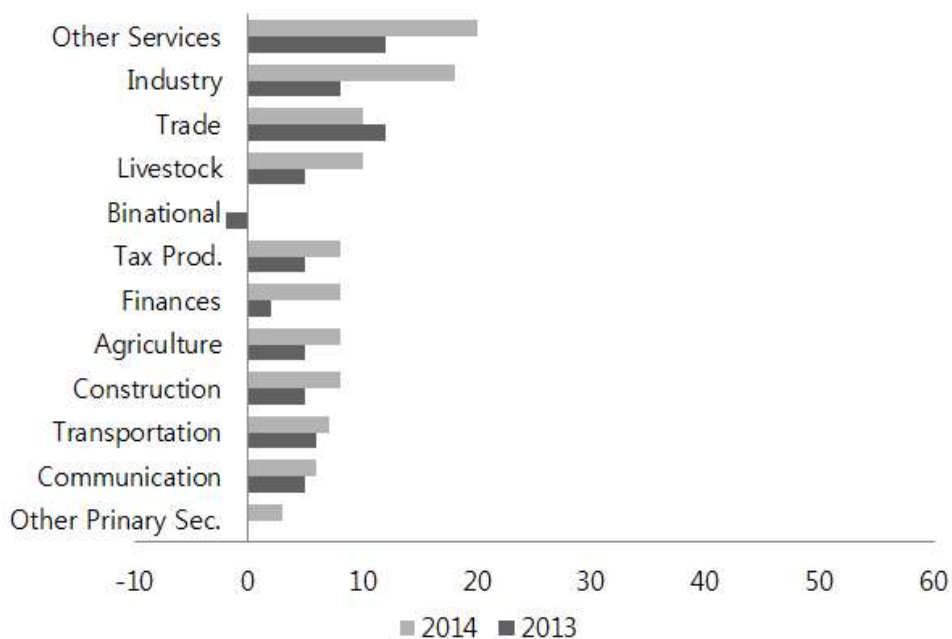
Exports of products originating in Paraguay constitute around 25% of GDP. 80% of these exports consists of agricultural commodities (soy, corn, rice, etc.) and agro-industrial processing, i.e., the entire food chain. Consequently, the production and export of corporate agriculture constitutes 20% of GDP. In recent years, Latin America has entered in a phase of low economic growth, largely explained by lower demand for commodities and low international prices. While Paraguay has emerged as one of the high-growth countries in the region for 2014, based mainly on good agricultural and livestock performance, it is difficult to think that this growth can sustain itself in the coming years.

1. The Agro-food Chain and Its Effects on the GDP

The calculations based on official data indicate that the (agriculture and livestock) primary sector has been having a very important incidence in the economic growth of Paraguay since 2004. Between 2004 and 2014 the agriculture contributed on average with 19% to the growth of the economy (industry and construction with 12% and the services sector with 69%). While the contribution to GDP growth from the agricultural sector seems not to be as significant in that period, there were years when this contribution was greater than 50%: 2007, 2010 and 2013. In those three years the GDP grew at an average annual rate of 11% and 56%, and the GDP growth was due to the contribution of the agricultural sector.

However, analyzing the effect of agriculture on GDP as part of the value chain of this sector is wrong because it poses a partial and isolated vision of intra-sectorial productive dynamics of the country. The agro-industry, mainly the food has grown in production and exports in recent years and, according to official figures, is half the manufacturing or industrial GDP. Adding figures of agro-industrial sector, the results are different. Without this aggregation, the contribution of agriculture and livestock would be reduced from 54% to 17% from 2013 to 2014, while the contributions to GDP growth from the manufacturing sector increase to 15%.

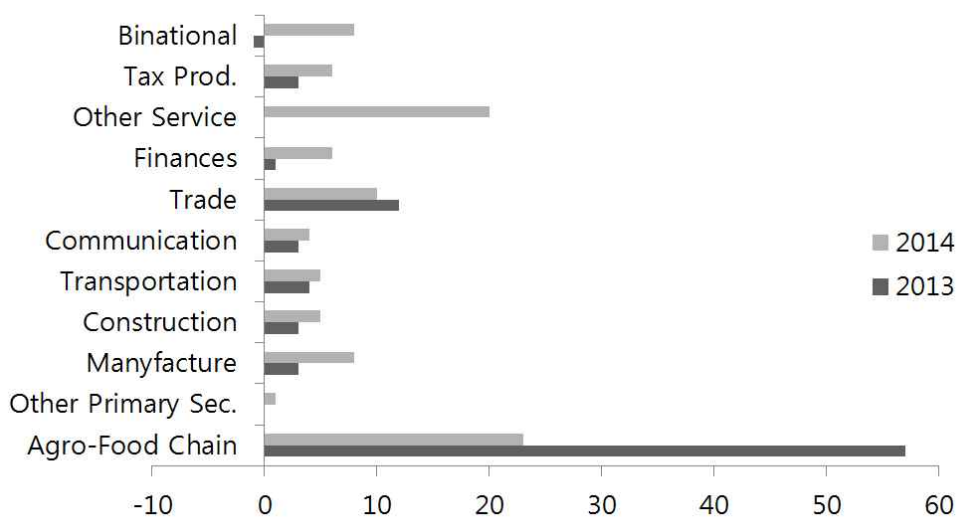
Figure 1-3. Contributions to the Growth of the GDP by Sectors without Agro-food Chain (%)



SOURCE: NATIONAL ACCOUNTS OF THE BCP.

When the agro-food sector is added to the primary sector, the contribution to GDP growth in the agro-food chain is 57% for 2013 and 23% for 2014. While the contribution of manufacturing to GDP was reduced from 6% to 3% in 2013, it was from 15 to 7.7% in 2014.

Figure 1-4. Contribution to the GDP by Sectors with Agro-food Chain (%)



SOURCE: NATIONAL ACCOUNTS OF THE BCP. ESTIMATED AMOUNTS FOR 2014

Taking into account the agro-industrial sector, it contains the basic minimum in industrial added value, so it can be concluded that agricultural commodities or agro-food chain is one that sets more dynamism to the productive sector of the country. Of course, the tertiary sector of services, trade and finance is the sector with great influence in the GDP and its contribution to GDP growth increases from 32 to 47% between 2013 and 2014. Anyway, a finer analysis of the food chain can show effects of growth in the tertiary sector, mainly in transportation, trade and finance activities. In short, the agricultural activities understood as value chain has a decisive influence on the annual changes in GDP.

2. Projections for 2015

Official figures shows that economic growth in 2015 projected at 4.5%, and key drivers are the service and construction sector. The incidence or contribution of the service sector to GDP growth will be 47% from the service and 8% from the construction sector. The construction sector is seen as the most dynamic area (11% growth) and the service sector, finance and transportation (5.5% growth). Regarding BCP projections for 2015, the low incidence was attributed to the (agricultural and livestock) primary sector on GDP growth: only 8%, with a variation of only 1.7%, livestock being the one that presents the most dynamic in the primary sector. In turn, a significant growth in the industrial and manufacturing sector is expected (5.2%) and a contribution of around 13% to the GDP growth is assumed.

Table 1-1. Variations of GDP by Sectors (In Real Terms)

Large Sector	2015**	Incidence 2015
Primary	1.7	0.4
Agriculture	0.5	0.1
Livestock	6	0.3
Other Primary	0	0
Secondary	6	1.5
Industry	5.2	0.6

Trade	5.5	0.8
Communications	33	0.1
Other Service 1/	5.6	0.9
Taxes	6	0.4
GDP at market prices	4.5	4.5

SOURCE: BCP.2015

According to these figures, the economic authorities of the country assume that in 2015, marked by the poor agricultural impact on GDP, 80% of economic growth is explained by the contribution of the service, manufacturing and construction sector. However, and taking into account the participation of agribusiness within the manufacturing sector, an estimate of the contribution of the food chain to GDP growth for 2015 would be around 16%, i.e. twice the lone contribution of the primary sector. However, this contribution is reduced significantly compared to 2014.

Two questions arise in relation to official GDP growth projections for 2015.

- The first is whether in the reduced contribution of the agro food chain the stagnation of international agricultural prices (from 2013) have been taken into account, on the one hand; on the other hand the special situation that the export of chilled meat would face considering the problems of the Russian economy (40% devaluation of its currency and GDP growth equal to 0.2% in 2014 and 0.5% in 2015). Russia is the target market of 52% of exports of meat from Paraguay and to find an alternative replacement market would not be possible in one year.
- The second question has to do with the service and construction sector as engines of growth of GDP in 2015. In the case of services, lower dynamics of agribusiness should affect trade, transport and industry finance. In the case of construction, the course seems to be handled

at the official level, that is, both bond and loan disbursements for construction projects as public-private partnerships (PPPs) would lead to a full implementation in the infrastructure sector.

However, there are doubts about the full use of bonds because of the restrictions brought by the Fiscal Responsibility Law, for the management capacity of the public sector. This would not be the case of PPPs, but the works planned for this type of investment may only timidly start in early 2015 (and not all at once). Investment projects that may be able to produce any concrete impact, the works are prioritized through the Law 5,074 / 13, which would be run by its accelerated approach "turnkey".

Finally, international organizations (IMF, World Bank) still think the national economy is still heavily dependent on agricultural commodities sector and still recommend to be gradually away from this dependence to avoid the consequences of volatility that it entails. Based on this last argument, can you expect a GDP growth in 2015 with an insignificant contribution of agribusiness sector?

Chapter 2

Structural Problems of the Agricultural Sector

The structure of agriculture in Paraguay, with 289,649 productive farms registered in the last National Census of Agriculture (CAN) 2008, is composed of small, medium and large producers, mainly associated in cooperatives, associations, committees, commissions and by individual producers, who are mostly incorporated into the market for goods and services in the economy, although there is considerable number of producers, which require a comprehensive state support for their sustainable inclusion in the formal market. Of consulted documentation, we could summarize the main structural problems presented by the agricultural sector, and are they as follows:

1. Regional Characteristics and Structure of the Production

The agricultural sector, which is the driver of economic development of

Paraguay, has a highly heterogeneous structure of production among producers, reflecting, among other indicators, the economic concentration of land and capital and the marked differences in access to international markets, and increasing environmental deterioration associated with prevailing patterns of production based on grain and livestock. These features of the structure of the agricultural sector are defined, especially as it relates to the marked productive activities and environmental differences between the two regions in the Paraguay River which divides the territory into: Western Region or Chaco And Eastern Region.

The Eastern Region covers 39% of the national territory and is home to almost 98% of the population. It has more than 800 rivers and streams and 95% of its land is arable; the annual rainfall varies from 1,400 mm to 1,700 mm. It has increased road and basic economic infrastructure services and better education coverage. In 1945, 55% of the eastern region was covered by forests, and now has been reduced to 6% of its surface. Western or Chaco region covers 61% of the national territory and is home to a little over 2% of the population. In this region, low level of rainfall is recorded with an annual average of 400 mm to 1,100; the soils are clay, and 65% coverage corresponds to natural woods and thickets. The main agricultural production in Western region is livestock.

In the two regions, the production structure is manifested in the coexistence of a dynamic and minority sector that works like enclave, and the other major sector that has little dynamism. The first brings together 16% of farms of medium and large commercial companies or cooperatives, incorporated into the formal mainstream of the economy. Moreover, a considerable number of traditional family farms correspond to 84% of the total, with a weak

presence in the sector and national economic context. These two groups also differ in each match export sector, associated with the production of soybeans and beef; while the other groups within the peasantfamilyagriculture(AFC) whose production includes several subsistence crops; their income in the past was mainly from the cultivation of cotton, and in recent years has been driven mainly by products like sesame.

The agrarian structure of Paraguay has been characterized in recent decades by major producers of soybeans and beef, in productive units of large areas which are even underutilized; and a large number of smallholders, whose production is based mainly on productive family. Among small producers they can characterize two groups distinguished by differences in access levels to the land, human capital and basic social services and production support to which they have access. Those who have had better access to basic services -in particular, education and health, have been constituted small rural middle class, whose economic activity is focused on agricultural activities and on some services such as sesame.

Another group of farmers with little education background have very limited access to land and effective access to agricultural extension services, whose low income puts them in poverty levels, depending on their survival in a meaningful social assistance. One of the characteristics of the families of smallholders is that young people emigrate to Asuncion or mainly to neighboring countries(World Bank. "Partnership Strategy for the Republic of Paraguay 2009-2013).

2. Access to the Productive Use of the Land

Paraguay faces major structural problems associated with social exclusion in rural areas. Governments have spoken of a comprehensive agrarian reform as leading policy to solve the poverty and marginalization of the rural population. These conditions are reflected in: i) the inequality regarding income and access to productive use of the land; ii) the high levels of rural poverty; iii) high proportion of small farmers with little education and very limited access to effective agricultural extension services, access to land and capital; iv) indigenous people in extreme social marginalization. Paraguay is among the four countries with the largest gaps in income distribution, which shows the GINI coefficient of 0.58, behind Brazil, Colombia, and Bolivia.

Table 2-1. GINI Coefficient 2005 -2011 - Latin America

Country	Circa 1995	Circa 2000	Circa 2005	Circa 2009
Latin America	0.574	0.567	0.546	0.534
Argentina	0.481	0.504	0.490	0.451
Brazil	0.592	0.588	0.564	0.537
Bolivia	0.580	0.617	0.576	0.572
Chile	0.548	0.552	0.518	0.519
Colombia	0.554	0.572	0.562	0.560

Panama	0.551	0.565	0.538	0.521
Paraguay	0.584	0.568	0.530	0.507
Peru	0.543	0.487	0.498	0.469
Uruguay	0.423	0.440	0.450	0.424

This situation is concurrent with the widespread concentration of land in LAC countries where Chile, Mexico and Paraguay the GINI index of distribution of land exceeds the value of 0.90, a situation that has persisted for decades.

The ECLAC study highlighted that “unequal access of rural population to this basic asset is a source of social tensions. In Paraguay, the most rural country in South America, the difficulties of access to land and high levels of rural poverty generated numerous conflicts during the nineties.”

The concentration of land, according to the census of 2008, reflects that the extension farms lower than 20 hectares, cultivated by small producers, correspond to 83.5% of the total. Adding farms with areas between 20 and 50 hectares, of medium producers, together correspond to 91.4% of existing farms, covering 6.3% of the land plots. Moreover 68% of the occupants of small farms for cultivation do not have land titles. 65% of rural production units have 5% of the land, while 1% of landowners hold two thirds of the total agricultural area. About 85% of small farmers, with properties smaller than 20 ha has no access to credit. Others may only use high-cost loans channeled through informal intermediaries; it is estimated that no more than 7% is served by the formal system. According to 2008 census data, 82% of farms (238,360) do not use credit. Moreover, only 15% of the credit is used for productive activities by the agricultural sector, despite its importance in the development and participation in the economy.

The credit coverage of public sector financial system is quite limited; thus, in 2008 the number of loans was around 26,000 for a total of GN \$ 460 million, of which 22% went to finance the small farmers through CAH. The low productivity of the land is exacerbated by insufficient education, as well as the inadequate use of inputs and technologies, product sales is realized in unfavorable conditions, and the area watered today is almost non-existent, despite the abundant water resources that the country has.

Also the human capital of farmers is limited in terms of educational attainment. In Paraguay there are a number of institutions that promote job training in both the public sector and the private sector. On the public level, the State has carried out training activities by the Ministries of Justice and Labor, Ministry of Education and Culture and Ministry of Agriculture and Livestock. The National Training and Job Training (SINAFOCAL), created by Law No. 1652 of 2000, aims to coordinate, monitor and finance job training designed to meet the requirements of the labor productive sector. This task is performed by taking advantage of offers of training and vocational training provided by public and private institutions within and outside the country, in the framework of programs and specific courses. Another important agent in job training partner is the National System of Professional Promotion (SNPP), created by Act No. 1253 of 1971. This institution aims at the organization, promotion and development of vocational training and perfecting them in offices of all economic sectors. Now, there is not an articulated system where these institutes converge within the context of developing the capacity of farmers.

Currently, it is remarkable that only one in three children living in rural areas completes the primary education, and continuing to the secondary level

is virtually nonexistent. Coverage of the rural social security is 7%, while reaching 21% in the case of the urban population.

3. Poverty and Marginalization

Paraguay has a high rate of poverty, and experienced in recent decades a very sluggish growth: average GDP growth was 2.2% between 1991 and 2009, and average per capita GDP growth has been only 0.1% during the same period. At the same time, the country's total poverty affected 38% of the population in 2008 compared to 35% in 1998, and extreme poverty to 19%. Poverty in Paraguay is still determined by rural poverty (48.8%) and the rural extreme poverty (30.8%).

In Paraguay, despite the relative decline of the rural population, this sector still has an important influence in the national population distribution (42%).

Table 2-2. Paraguay: Poverty Rate by Area of Residence (In Percentages)

AREA	EXTREME POVERTY	NOT EXTREME POVERTY	TOTAL POVERTY	NOT POOR
URBAN	11.2	20.6	31.8	68.2
RURAL	30.8	17.9	48.8	51.2
TOTAL	19.4	19.5	38.8	61.2

SOURCE: HOUSEHOLD SURVEYS 2008, GENERAL DIRECTORATE OF STATISTICS, SURVEYS AND CENSUS (DGEEC)

Table 2-3. Poverty Rate by Department (In Percentages)

DEPARTMENT	EXTREME POVERTY	NOT EXTREME POVERTY	TOTAL POVERTY	POPULATION	POPULATION DENSITY
ASUNCION	7.1	15.8	22.9	518,945	8.4
CONCEPTION	30.0	15.3	42.4	207,201	3.4
SAN PEDRO	35.1	18.8	53.9	353,064	5.7
CORDILLERA	17.1	20.3	37.5	284,256	4.6
GUAIRA	18.4	18.7	37.1	213,635	3.5
CAAGUAZU	33.3	18.8	52.0	476,225	7.7
CAAZAPA	25.0	16.9	41.8	138,365	2.2
ITAPUA	28.3	19.5	47.8	523,161	8.5
MISIONES	27.1	19.0	46.1	120,848	2.0
PARAGUARI	22.0	18.4	40.4	245,097	4.0
ALTO PARANA	16.2	13.0	29.1	720,293	11.7
CENTRAL	11.6	25.7	37.3	1,929,834	31.3
NEEMBUCU	23.2	18.2	41.4	80,130	1.3
AMAMBAY	12.8	17.2	30.0	98,569	1.6
CANINDEYU	41.7	12.0	53.7	168,325	2.7
PTE HAYES	13.9	6.3	30.3	85,965	1.4
TOTAL	19.4	19.5	38.8	6,163,913	100.0

The situation is complex partly because: there are serious problems of access to land for new farming families; most of the current owners working with too small or badly worn floor surfaces, production is concentrated in a few crops subject to deterioration of yields and price instability. To this it is added that most of the farmers are without land titles, which generate disputes and deprives them of guarantees that would facilitate access to credit. Since 1990, Paraguay's economic structure based on activities with intensive use of unskilled labor (cotton) has been quickly replaced by one based on intensive activities using capital and land (soybean, wheat and meat); it generates economic growth but little labor demand.

On the other hand, agricultural diversification (especially family agriculture) and agro-industrialization process manifest slowly, which pays off in no al-

ternative jobs for idle rural labor (Masi, 2008).

The indigenous population, which in 2008 was estimated at 108,300 people, due to their conditions of poverty, faces particular challenges. Nearly 75% of its working population (ten or more years old) work in the primary sector, agriculture related activities. Among 412 registered indigenous communities nationwide, only 26% have their own health centers. 38.9% of indigenous people aged 15 and older are illiterate. Just 12.2% of the indigenous population has health insurance.

In the general context that characterizes rural poverty in Paraguay, women stand out as the most disadvantaged and vulnerable group. For every 100 households in extreme poverty, 34.2% are female headed households. This has been generated by factors of exclusion, low level of participation and recognition in communities and organizations. Inequality persists in access of rural women to services and public goods. In most cases, women have insufficient or no income to cover minimum subsistence needs. The deterioration of family farms, generated by the separation of families for work, with male migration, poverty aggravates women.

Chapter 3

Situation of the Family Farming

1. Typology of the Family Farming - Paraguay

For the MAG - PARAGUAY, the Family Farming is based on the Resolution of the GMC 25/07 Guidelines for the Recognition and Identification of the Family FARMING in the Mercosur: “Rural productive activity is executed by mainly using family labor for production in a property.” Also it does not hire laborers during the year more than 20 days who receive salary temporarily in specific times of the production process, which reside on the farm and / or in nearby communities, and that does not under any conditions own or lease over 50 hectares in the eastern region and 500 hectares in the western region of land regardless the production category”. It is composed of persons related by kinship, dependency and / or mode of living that live in the same production unit. The family can be formed directly related to the chief or head of household-father, mother, sons and daughters (nuclear family), and indirectly through another relation-

ship or cohabitation (extended family) members. That form can be formal, legal, civil or religious marriage, or indeed no formal, consensual or concubines. (Website- MAG, 17/02/2011)

Article. 6 of the Law of the Paraguayan Nation No. 2.419 / 2004, "establishing the National Institute of Rural Development and Land" Family Agriculture (AF) is conceptualized "as one in which the basic resource of labor is provided by the family, being its production basically for subsistence and partially commercial completing the income from other productions of traditional character or king-farm".

2. Features of the Family Farming

The main features of family farming are:

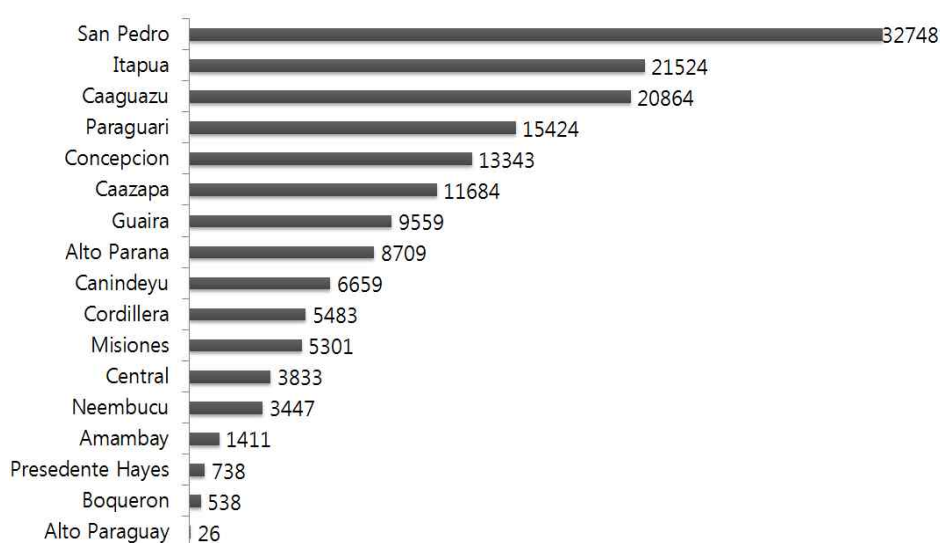
- The labor employed on the farm mainly correspond to the family, and employment of contract workers is limited;
- The family is directly responsible for the production and management of agricultural, livestock and / or forestry, and reside in the own farm or in a neighboring locality, and necessarily income must come from agricultural production batch.
- Productive resources are compatible with the working capacity of the family with the activity and the technology used.
- The farmers without land, the beneficiaries of the land reform programs or who enter and remain in the ground, as well as other land policies,

and communities of producers / or indigenous people who are making common use of the land are part of family farming, respecting the other criteria

3. Socio-Economic Characterization of the Family Farming

According to the Document - Paraguayan Rural Sector: An Overview for an informed dialogue- UNDP -2010, in December 2009 the RENAF had registered 161,291 farmers, whose geographic distribution is presented in <Figure 3-1>.

Figure 3-1. Amount of Farmers of the Family Farming by Department (MAG-RENAF)

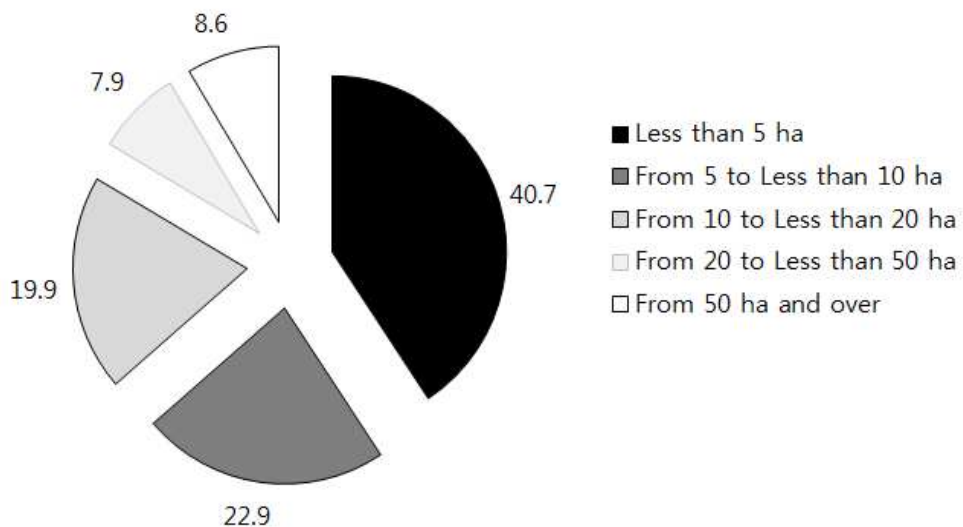


Source: Elaborado en base a datos de la Direccion Nacional de Censo y Estadisticas agropecuarias 2009, MAG-RENAF

The departments that hold farms of the family farming are located in San Pedro (20.3% of all farms of the department), Itapúa and Caaguazú (13.3% and 12.9%, respectively), Paraguari (9.6%), Concepción (8.3%) and Caazapá (7.2%). The vast northeastern region of Eastern Paraguay (Alto Paraná, Amambay and Canindeyú), agribusiness and factory farming, holds only 10.4% of such farms.

Document of UNDP-2010, considered the farms under 50 ha as family farming, and 50 hectares or more as medium and big scale farmers (MBSF). According to these parameters and the National Agricultural Census 2008 (CAN 2008), the family farming would cover just over one million people and MBSF less than forty thousand.

Figure 3-2. Percentage of Farms by Size (National Agricultural Census-2008)



Source: Elaboracion propia en base al Censo Agropecuario Nacional 2008, MAG

With this classification, rather than building a typology, it seeks to bring together farmers with potential or roughly similar restrictions, so as to facilitate analysis of the rural reality. In fact, both the family farming and PGMs, there are differentiations, but the aforementioned reason chooses to consider only as two groups. When necessary, analysis concerning specific subgroups will be performed.

3.1. Sub Groups in the Family Farming

Farms under 50 ha or from the family farming, four types are distinguished. Type I Involves farmers with less than 5 ha located around provincial capitals in the central region of eastern Paraguay and ancient settlements in the interior areas and they are devoted to subsistence and fruit and vegetable production. With regard to income, agricultural activity on the farm is complementary, since these families perform off-farm jobs and even non-agricultural activities. The layer includes those who perform some agricultural work, but not own land.

Type II Comprises farmers with 5 to less than 10 ha who occupy areas of subsistence income, with occasional off-farm work. They employ family labor, are poorly capitalized, and therefore its ability to intensive farming and productivity are low. They achieve low incomes and are very vulnerable to the expansion of medium and large farms in the Eastern Region.

Type III Includes farmers with 10 to less than 20 ha, whose farming is the main source of livelihood. They made little off-farm work. They have some

bovines, average operating capacity and certain capital goods (mill, grinder, plowing, etc.). Both its production level and income are low.

Type IV Work with areas from 20 to 50 ha and its capitalization allows them a better exploit of their farms and being more efficiently linked to market and higher incomes. They appeal to family labor and hire labor, using hand tools or leasing services or mechanized tilling of soil. The latter are eventually associated with major producers of soybeans and corn. Their farms originate in the concentration of lots through Agrarian Reform or splitting of large surface properties.

In contrast to family farming, medium and big scale farmers (MBSF) are characterized by mechanized production of commodities (soy, corn, wheat), the intensive use of capital, technology and agrochemicals, soil preparation and mechanized harvesting, and low hiring temporary labor in relation to its surface.

According to this classification of the CAN in 2008, there were 241,956 farms (83.5% of all farms) less than 20 ha, and 22,865 farms with 20 ha to less than 50 ha (7.9%). Therefore, since the RENAF has counted just 161,292 producers, it means that not all residents on farms smaller than 20 ha (241 956) are registered.

Table 3-1. Sub Groups in the Family Farming

Range of Area (ha.)	Family Farming					Medium- and Large-sized Producer
	Type I	Type II	Type III	Type IV	Total	Type V
	Less than 5	5 to <10	10 to <20	20 to <50	less than 50 Ha	50 and over
Amount of farms	118,003	66,218	57,735	22,865	264,821	24,828
Total Area	238,013	416,702	685,381	619,986	1,960,082	29,126,813
Average Area	2.0	6.3	12.0	27.1	7.4	1173.1

The characterization of productive units shows the differences regarding the size and destination of production, applied technology, productivity achieved and the available assets. That is, the family farming, in significant measure, has limited production capacity for self-consumption and thus needs to earn income to enable people living in these production units to expand their capacities to learn, live healthy, be more productive and feel safe.

3.2. Demographic Profile of the Rural Households

In 2008, of the total of 289,649 farms surveyed, 278 967 (96.3%) belong to individual producers, of which 235 904 (81.4%) are included in the family farming and represent 1,039,330 households' members, as can be seen in the following table:

Table 3-2. Demographic Profile of the Rural Households

	Total farmers residing in farms	Total household members	Amount of members by house	Sex (From 10 years and over)			Total under 10 years old
				Total	Men	Women	
Country 2008	246,728	1,077,589	4.4	831,134	446,008	385,126	246,455
Country 1991	303,806	1,598,724	5.3	1,122,830	595,430	527,400	475,894
Variation (%)	-18.8	-32.6		-26	-25.1	-27	-48.2
FAM.FAR M	235,904	1,039,330	4.4	798,811	428,282	370,529	240,519
MBSF	10,824	38,259	3.5	32,323	17,726	14,597	5,936

The female population aged 10 or more is 46.3% in households of the family farming and 45.2% in households of medium and large farmers. That is, in both cases there is a male majority. The size of households in the family farming is greater than that of medium and large farmers in nearly one more household member (4.4 and 3.5, respectively). The number of famers and members of their households has declined in the inter census period (1991-2008), experiencing the biggest decline in the population under 10 years of age (48.2%) compared to 10 years or most (26.0%). One of the reasons for the decline of household members is due to internal and international migration. The latter had an upward increase in the period 2003/2007 and involved international migration of 255,932 people, of which 48.1% came from rural areas (UNDP, 2009).

In relation to women, they begin to develop off-farm activities, preferably domestic service in nearby villages. Once consolidated in activity, they migrate to the city, especially those who were residing in dormitory cities or

in nearby departmental capitals. This phenomenon follows logic of subsistence due to the impossibility to find work in the place of origin.

This female mobility for work reasons have contributed to the sharp decline in the population under 10 years (48.2%) in the inter census period, along with other factors such as family planning measures and presumably awareness of responsible parenthood.

The composition of population by age shows that the population pyramid of farms is very broad at the base, as shown on the <Table 3-3>. Of all farm residents (1,077,589) the highest proportion occurs in less than 10 years (22.9%), 10-14 years (12.0%) and 15-24 years (19.2 %), and then decreases successively in the other age ranges.

Table 3-3. Amount of Members by House from 10 Years Old and Over, by Groups of Age and Type of Farmer

	Total members from 10 years and over	House members by age							
		From 10 to 14 years	From 15 to 24 years	From 25 to 34 years	From 35 to 44 years	From 45 to 54 years	From 55 to 64 years	From 65 to 74 years	No Info.
Country 2008	831,134	128,868	206,393	119,780	118,349	110,390	75,379	67,049	4,926
Country 1991	1,122,830	192,739	292,879	206,657	157,968	113,966	75,127	64,320	19,179
Variation(%)	-26.0	-33.1	-29.5	-42.0	-25.1	-3.1	0.3	4.2	-74.3
FAM.FARM	812,657	126,995	202,730	117,295	115,205	107,445	73,154	65,329	4,504
MBSF	18,477	1,873	3,663	2,485	3,144	2,945	2,225	1,720	422

The population decline in the age groups under 44 years old is explained, again, internal and international migration. Regarding International, 75.7% of the population who migrated abroad in the 2003/2007 period was 15 to 29 years of age and 13.4% of 30-39 years (UNDP, 2009). The lower-age (10-24 years) in total household members of farms smaller than 50 hectares, is on average 40%; This reveals potential work conditions for agricultural

activities.

3.3. Health and Sanitation

With regard to the field of health, it is important to mention that at the national level has a state system of social security and health insurance (IPS). The results are not very encouraging, given that the level of coverage of the system is reduced.

In rural areas, people who benefit from this system barely reach 8%, compared with 24.6% in urban areas (EPH 2011). On the other hand, 7.7% of the total population has other health insurance. This percentage in rural areas reaches only 2.7%. 74.4% at the country level and 89.3% of the population living in the countryside do not have any health insurance (EPH 2011). Access to Basic Health Service for family farming is virtually nil in its residence area; they must usually be moved to the departmental capitals or Asunción or Department of Central. The most common diseases are pneumonia, gastro enteric, observable most often in children, apart from parasitic ones, skin problems are the most common. It is common problems resulting from poisoning with agrochemicals.

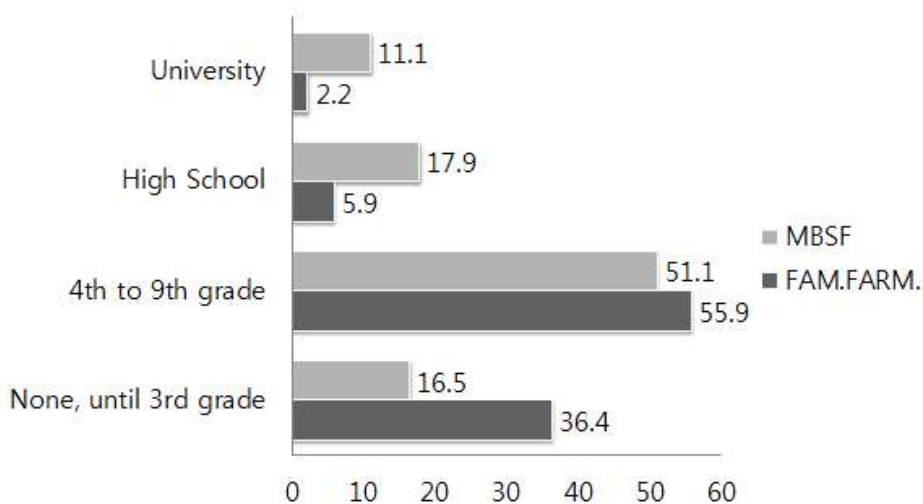
The rural sector is characterized by access to water supplied by the National Environmental Health Service (SENASA) and use off-pump wells, and secondarily use pump wells or community network. Regarding sanitation in the rural sector more than half of households use single or pit latrine (with the risks to health), and more than a third of latrine with cesspool. In relation to the environment and health, almost two-thirds of rural households use

wood for cooking and dispose of garbage by burning.

3.4. Education

The heads of households of medium and large farmers have higher levels of education: three in ten have high school or technical education (17.9%) or university education (11.1%); while, at the other end, just over one in three heads or heads of family farms has finished only third grade up, or no schooling, according to the <Figure 3-3> below.

Figure 3-3. Education Levels of the Family Farming Households



Source: Elaborado en base al CAN 2008, MAG

Teens that have low education level or strive to build agricultural activity, have the option of joining an agricultural school. This addition is subject to the economic status of the parents, given the dispersion in the regional distribution of these schools. Farmers who have the Agricultural Technical Baccalaureate represent 16% of those with secondary education and 0.09%

of all individual farmers counted.

Agricultural Education is under the charge of the Directorate of Agricultural Education (DEA) of MAG, which administers the Agricultural Formal Technical Education (Technical and Vocational Training in Basic Education levels: EBB and Technical Middle and High School) and permanent training. In an agricultural country the number of educational units for this sector is low and with quite low coverage: 111 educational units have 6,102 enrolled students of which 4,488 are men and 1,614 are women.

Of the 111 agricultural and agro-mechanical institutions 9 are under the State (by the MAG); 6 by local governments; private are 21 and 75 by the MEC.

Since rural poverty affects 1,243,693 people, of which 786,795 are extremely poor (DGEEC, 2008), it is reasonable to assume truancy, which is exacerbated when the age of the student population is higher. Indeed, 88,731 adolescents (0-14 years old) linked to family agriculture work, of these 77 085 (86%) are fully working (6 months or more). The aim is to create conditions for family support, with the consequent weakening of their educational opportunities.

4. Differentiated Profile of Agricultural Production

Family farming is highly responsible for the production of a dozen crops such as beans and cassava (94% of national production), sweet potatoes (89.6%) and fruit greatly. They are generally perishable items and mecha-

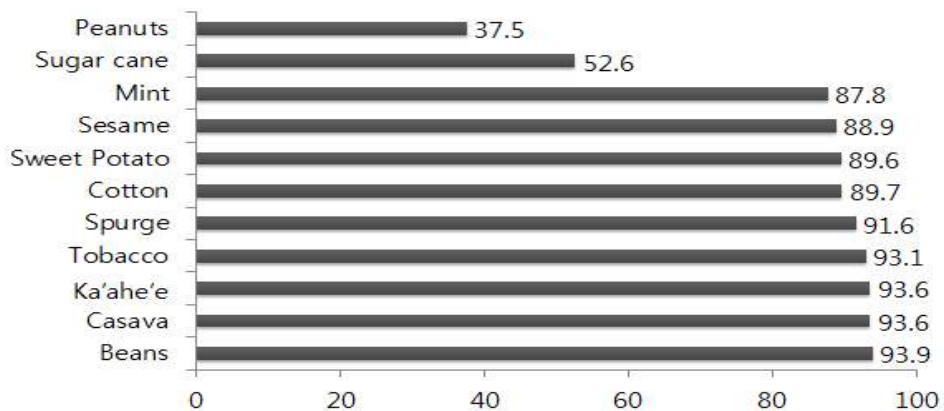
nization is not feasible, demanding intensive labor; meanwhile are suitable not only for income but also for consumption of farming families (Table 3-4 and Figure 3-4).

Table 3-4. Participation of the Family Farming in Total Production

ITEMS	Family farming			Total in the country			% of production
	Amount of Farms	Cultivated Has.	Amount of Animals	Number of farms	Cultivated Has.	Amount of Animals	FAM. FARM .
Beans	208,655	52,180	41,883	213,999	55,424	44,628	93.9
Casava	219,032	161,222	2,075,594	225,327	170,694	2,218,530	93.6
Ka'ahe'e	1,303	771	911	1,328	811	973	93.6
Tobacco	2,545	2,078	3,500	2,577	2,220	3,761	93.1
Spurge	4,655	4,266	4,506	4,715	4,828	4,919	91.6
Cotton	52,791	60,331	57,205	53,474	66,256	63,760	89.7
Sweet Potato	12,391	4,519	38,891	13,094	4,973	43,390	89.6
Sesame	40,176	60,537	44,506	40,869	69,857	50,049	88.9
Mint	490	537	1,016	497	598	1,158	87.8
Sugar cane	19,784	44,863	2,672,521	20,550	81,830	5,079,612	52.6
Peanuts	47,592	13,886	11,254	48,691	24,113	29,988	37.5

Figure 3-4. Participation of the Family Farming by Items

unit: % (of the total production)



Family farming also plays an important role in food security and sovereignty, preserves germplasm (genetic variability that can perpetuate a species) of native species such as peanut jhuí, Avati Carapé pyta, Cururú squash, beans San Francisco, etc. It employs more than 60% of the rural PEA totaling about 1.2 million people and produces items of strategic income (sesame ka'a he'e, lemon verbena, etc.) for foreign exchange earnings.

While the production of certain commercial items has been reduced in the period between the two agricultural censuses, especially cotton and snuff (primarily black), there have been other areas such as Cedron Paraguay, sesame, mint, blond snuff, ka'a he'e, etc.

However, these items as a whole have not reached the dimensions of cotton production, which involved a significant number of the rural population; in 1991 around more than 1,100,000 people were engaged in the process of ginning, processing and marketing.

It is important to remark that, in the absence of different climates, despite differences in their locations and sizes, most of the farms maintained the same structure of production of consumption items, consisting of beans, maize, cassava, sweet potatoes and peanuts, and breeding of farm animals such as chickens, pigs and a few cows.

Family farming is very vulnerable to prices due to the excessive permeability of national borders, and this permeability is even more critical than that imposed by the small size of the domestic market. The limited production capacity of off-season items with adequate quality makes the pro-

duction seasonality generate a clutter in the market with the consequent reduction in prices. In periods of shortage, they import farm products, especially from Argentina, which prevents excessive prices or market shortages. This occurs, among other things due to the difficulties to rationalize the offer in the absence of organization of production, with the consequent maintenance of a system of permanent competition from extra-border suppliers whose competitiveness is often favored to the suppliers due to exchange differences between currencies. The little ability to diversify production requires many cities have to self-provide farm products from great distances, preferably in the capital, which reach the consumer with exacerbated prices having gone through 4 or 5 intermediaries.

4.1. Soil Management

Practice management and soil conservation over the family farming is implemented by crop rotation, used by 55.5% of these farms. Other components of the management and conservation of soil (contour, green manure, organic certification and direct sowing) are poorly implemented in the family farming.

In relation to total hectares planted, medium and large farmers outweigh the largest numbers of family farming (161 thousand ha of cassava, sesame has 61,000, 61,000 ha of cotton and 45 thousand hectares of sugarcane).

According to the CAN 2008, that year there were 630,000 ha planted with corn and soybean occupied more than 2.3 million hectares. 66.2% of all

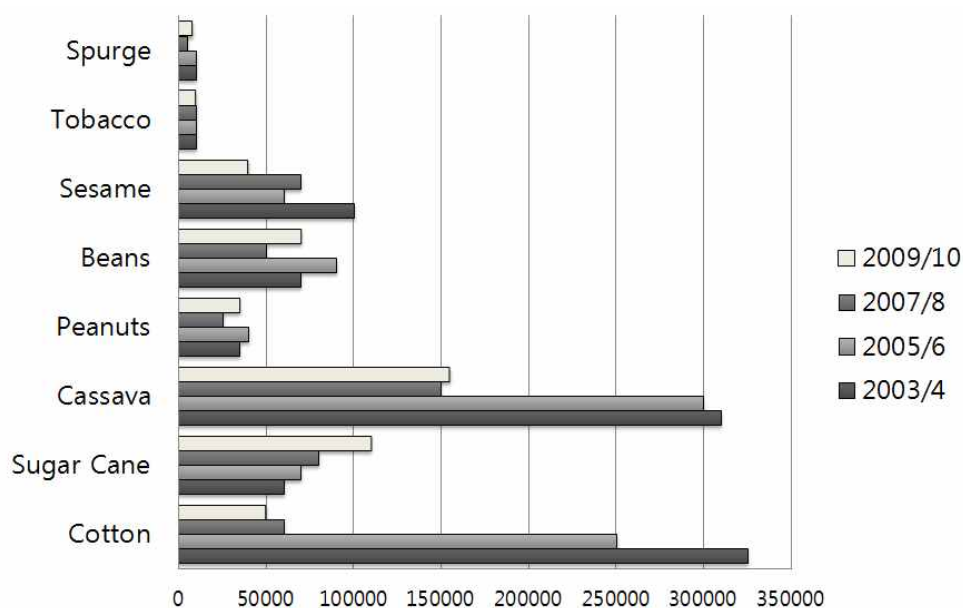
farms in the family farming implements "land management", amounting to 71.8% in the case of farms of 5 to less than 20 ha. Also, the 187,540 farms with "soil management" the 93.5% corresponds to the family farming , being the most representative farm from 1 to less than 5 ha (34.7%) type.

4.2. Expansion of the Soybean and Substitution of the Cotton

The item of historic income of family farming was cotton, and among other things, due to changes in the policy of MAG, the weevil and the fall in international prices fell from 320,000 planted ha (2004) to one sixth part of that surface in the 2009/10 harvest.

This was replaced as income crop, sesame, requires little capital and its cultivation technique is accessible to the rural economy, which experienced significant price variations in each harvest (of G. 2,000 to 10,000 G. each kilo/ sesame). According to DEAG, in 2014, it occupied an area of 60,000 ha. Average yields were 690Kg / ha. A volume of production is approximately 41,400 tons. The average price at farms in 2013 was 5,000 Gs / kg.

Figure 3-5. Evolution of Cultivated has by ITEMS of the Family Farming
2003-2010



Source: Elaborado en base a datos de la DCRA del MAG

Following the evolution through harvests (alternated) since 2003, sesame (increased from 40,000 to 100,000 ha) and sugarcane for industrial use (from 70,000 to 81,400 ha) showed significant growth among farmers income crops. Cassava, another traditional item of income and consumption of family farming, also showed a persistent decline since 2003/4 (from 306,000 to 170,000 ha), while the beans, snuff and spurge remained, despite strong variations in their planting areas compared to seven years ago.

4.3. Differentiated Profile of the Livestock Production

Breeding of small animals, especially pigs and poultry is characteristic of rural culture and is present in all groups of family farming.

Table 3-5. Principal Breeds of Small Cattle and Poultry, Raised by Type of Farms

Production of small cattle/poultry	Ovine		Caprine		Porcine		Chickens	
	Number of Farms	Amount of Animals	Number of farms	Amount of Animals	Number of farms	Amount of Animals	Number of farms	Amount of Animals
Total Country	23,138	364,514	9,689	129,898	199,895	1,072,655	233,369	16,056
<5 Ha	3,793	20,910	1,934	10,096	79,716	286,567	97,594	2,946
from 5 to <10 Ha	3,425	21,995	1,488	6,892	50,640	217,500	56,139	2,843
from 10 to <20 Ha	4,863	37,819	1,848	9,966	44,260	231,761	48,221	3,066
From 20 to < 50 Ha	4,028	42,986	1,312	11,286	15,796	119,523	17,921	2,402
FAM, FARM.	16,109	123,710	6,582	38,240	190,412	855,351	219,875	11,257
MBSF	7,029	240,804	3,107	91,658	9,483	217,304	13,494	4,799

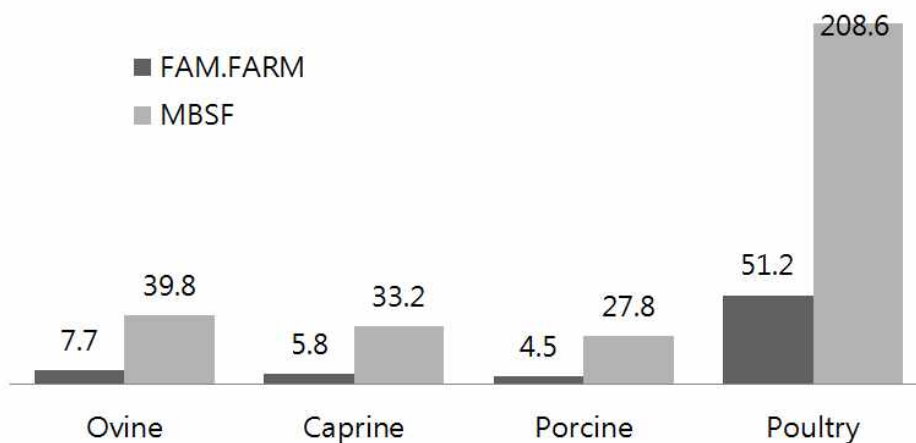
This activity is intended to supplement the income -the pig farming is the "piggy bank" of poor rural families or consumption on festive occasions. The sheep and goats are more common in farms of MBSF (21.5% and 10.2% of farms, respectively, but in the family farm it is almost exceptional (6.1% and 2.5% respectively).

By contrast, the breeding of pigs (71.9% of family farming farms) and poultry (83%) is more typical among family farms. Breeding pigs can use grain,

cassava and green fodder for meat; but it requires surplus production, appropriate techniques and machinery.

These requirements hamper production on small farms, despite the demand for the product. This activity takes place on a larger scale in areas of Brazilian migrants, who have the habit of consumption and known breeding techniques. The volume of breeding is in direct proportion to the size of farm, for all types of small livestock and poultry (Figure 3-6).

Figure 3-6. Average of Animals by Type of Farm



In peasant farms, breeding of pigs as well as chickens except laying hens are usually in charge of women and children, allowing greater use of family labor on the farm. Breeding and fattening with balanced nutrients and adequate sanitation are not widespread in the family farming of lots fewer than 10 ha.

Cattle are used to traction (oxen) or provision of milk for consumption and residual sales, and as a reserve available for contingent times of crisis or health. Cattle production grows in direct proportion with farm size due to the need for forest and native pastures or implanted places for fattening.

Table 3-6. Principal Breeds of Cattle by Type of Farm

Production of cattle	Cows and biscons		Equine	
	Number of Farms	Amount of Animals	Number of farms	Amount of Animals
Total Country	191,689	10,496,641	73,729	283,804
<5 Ha	62,931	302,972	17,550	27,981
from 5 to <10 Ha	45,144	308,628	14,594	23,828
from 10 to <20 Ha	43,844	448,880	16,632	29,762
From 20 to < 50 Ha	19,273	440,136	10,076	22,741
FAM, FARM.	171,192	1,534,861	58,852	104,322
MBSF	20,497	8,961,780	14,877	179,482

A strong concentration occurred in the period between 1991/2008 with regard to livestock (cattle and horses). The number of farms owning less than 4 animals-from family farming at micro and large land levels- fell from 101,132 to 75,219 units, also was - although less accentuated - declined in the number of farms owning 5-9 animals (10,159 farms less), and 10 to 49 animals (5,812 farms less). The concentration of bovine cattle was developed on farms that possessed 50-199 animals, they grew to 1,911 units; the ones of 200-999, rose by 1,444 and the ones possessing more than 1,000 animals went from 1,246 farms in the year 1991 to 1,986 in 2008. Big scale livestock shows significant asymmetries. Despite the aforementioned concentration, two-thirds of family farmers still possess cattle (oxen and dairy).

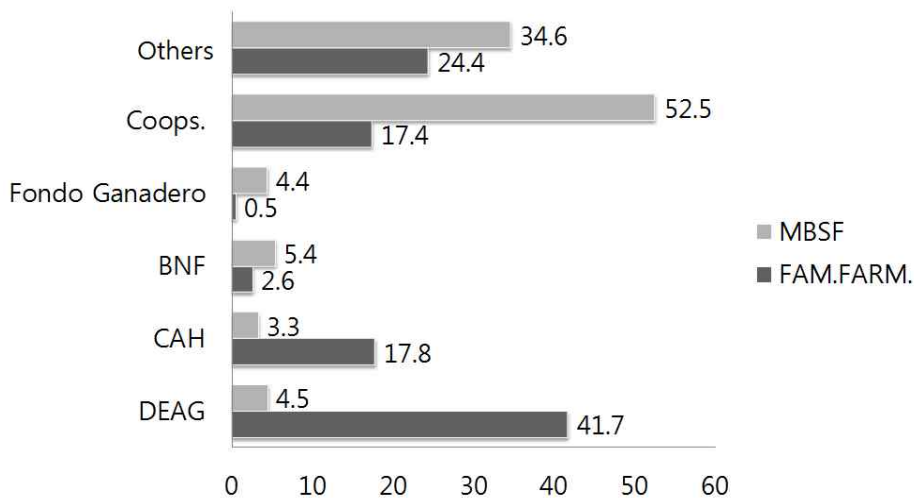
However, the number of cattle depends directly on the size of the farm: those with less than 5 ha with an average of 5 animals (figure itself high,

which may be due to the weight of dairy farms), and 20 less than 50 ha. The MBSF had in 2008 about 585 head of cattle per farm on average.

4.4. Level of Technical Assistance

First, there are differences between farms in the family farming and assisted MBSF; of all those accounts with this service 13.9% compared to 38.0% of them. Secondly, there are also differences by source of technical assistance (Figure 3-7).

Figure 3-7. Technical Assistance for Farmers, in % of Farms



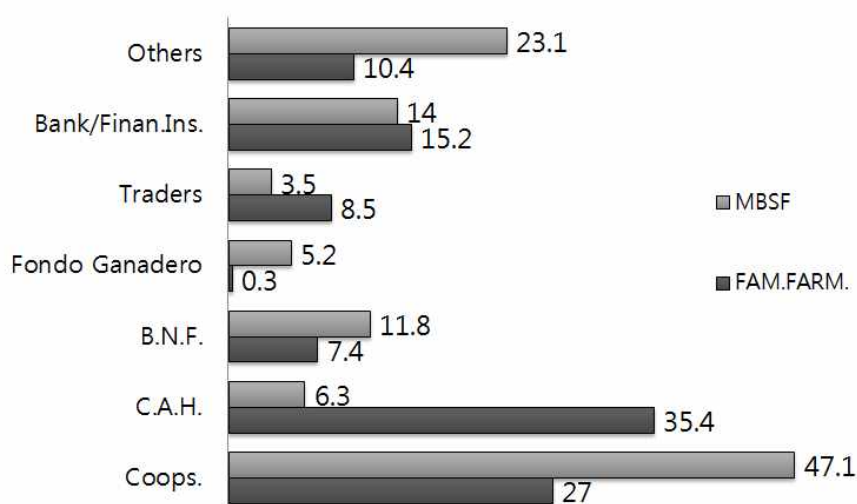
Medium and Big scale farmers receive from cooperatives and hired technicians or companies ("other"), while the family farming appeals primarily to public sector bodies as DEAg and CAH (especially smallholders and subsistence farms). The cooperative assistance is marginal for the family farming of less than 10 ha, and very relevant among MBSF.

4.5. Level of Assistance for the Financing

Financial assistance benefits 51,289 farms, accounting for 17.7% of all farms (289 649). This access is given asymmetrically. 15.9% of the farms in the family farming and 36.8% of medium and big scale farmers receive credit. 84.6% of family farmers receive no credit; of those who access, the 2.8% comes from public financial entities and 27.0% from cooperatives. Indeed, there are also differences of credit sources, as is clear from the <Figure 3-8>.

Figure 3-8. Source of Financing

Unit: %



Source: Elaborado en base al CAN 2008, MAG

The MBSF preferably resort to cooperatives (47.1%), the National Development Bank (BNF) (11.8%) and the Livestock Fund (6.3%), while family farming access to financing through Agricultural Credit (CAH) (35.4%) and, second, cooperatives (27.0%). There is a similarity in access to banking and financial credits (14.0% and 15.2%). And the collectors and dealers as a source of financing are doubly important to farmers with less than 50 ha (8.5%) than to medium and big scale farmers (3.5%).

High operating costs and the risk of microcredit are two factors limiting private entities to provide credit to small farmers. However, there are specialized companies that lend to this sector, representing 15.0% of total loans to the productive sector.

Considering the total of on-farm residents (246,728), only 41,882 (17.7%) receives credit, of which 36,196 (86.4%) were men and 5,686 (13.6%) were women. Analyzing proportion to the number of farms run by men (193,292) and women (53 436), the situation is perceived more equal: 18.7% of men and 10.6% of women receive credit. There is no credit offer to small farmers or landless workers who want to buy small plots for farming. This creates a vicious circle: due to lack of land they have no access to credit and cannot develop its productive capacity.

In the country it is estimated that each technician in the public financial sector serves between 300-400 farmers, so it is possible to say that they are geared to develop task more like financial resource distributors than supporters for the success of the production.

5. Conclusions

- The living conditions of the rural sector are of lower quality compared to the urban sector according to DGEEC indicators, which places the rural population as a priority for human development in the country. According to UNDP (INDH 2008), high levels of inequality between the urban and rural sectors are detected.
- Within the rural sector, again, dissimilar living conditions are presented, both, among subtypes of farms between family farming and the group of MBSF.
- The importance of family farming for human development, in the case of Paraguay, is that the vast majority of the population belongs to rural productive stratum of family farming.
- The limitations on the overall living conditions of the rural population constitute an effect, and in turn a cause, of the limitations to the expansion of human capabilities of this population.
- Socio-economic achievements and welfare of the rural population is restricted to this lack of sufficient capacity to be productive, and organized, and to participate in decisions that affect them, among others. These limited capabilities in turn restrict these achievements.

- There are restrictions of opportunities for expansion of the above capabilities. According to that report (UNDP 2008), this is mainly due to the limitations of the state in terms of its ability to fulfill one of its basic roles: to provide quality services to the entire population.
- Education policy, health protection and social assistance, housing and basic services need to be focused on the poorest and most vulnerable populations, to achieve the principle of universality of public policy.
- The sharp decline of the rural population in the productive sector, especially of young people, is consistent with living conditions, capacities and opportunities identified.
- The substantial reduction of the population under 10 years will also denote the effects of changing cultural norms regarding reproductive health.
- The decrease of the young population in the farms of family farming is a powerful symbol of the insufficient opportunities locally, especially for the female population, and it is also consistent with the level of emigration of this population to the outside (UNDP 2009).

Chapter 4

Policies and Strategies Implemented by the MAG for the Family Farming

Official statistics show that during 2014 there has been a slight reduction in poverty from 23.8% to 22.6%; however, extreme poverty or indigence rose slightly from 10.1% to 10.5%. In strictly technical terms we can say that there was almost no change compared to 2013. The draft General National Budget for fiscal year 2015 aims to allocate G. 25.71 billion (USD 5864.9 million) for poverty reduction and development. This is part of the new strategic objectives matrix that seeks to make more flexible resource allocation and more efficient budget control.

Family farming is linked to the fight against rural poverty and in that senses the MAG, planning and operational instruments, aimed at reducing the factors that make rural poverty, especially extreme.

1. Agricultural Strategic Framework (ASF) Basic Guidelines 2014/2018

Official statistics show that during 2014 it has been seen a slight reduction in poverty from 23.8% to 22.6%; however, extreme poverty or indigence rose slightly from 10.1% to 10.5%. In strictly technical terms we can say that there was almost no change in relation to 2013. The draft General National Budget for fiscal year 2015 aims to allocate G. 25.71 billion (USD 5864.9 million) for poverty reduction and development. This is part of the new strategic objectives matrix that seeks to make more flexible resource allocation and more efficient budget control.

Family farming is linked to the fight against rural poverty and in that sense the MAG, it would develop a planning and operational instruments, aimed at reducing the factors that make rural poverty, especially extreme. A description of the instruments used by the MAG.

It is a sectorial document involving the whole agrarian institutions fostering an integrated, strategic and operational management consistent with sense of state. The ASF reference a set of policies and strategies for agricultural and rural development; It is a roadmap designed with long-term vision, being built from consensus around a renewed and lasting orientation of the process of sector development, projection and territorial approach.

1.1. Strategic Elements

The ASF provides the following strategic elements:

Strategic Element	Component	Programmatic Lines
Agricultural Competitiveness	It refers to the general policy and is expected to have the greatest impact on production, according to market requirements, in terms of price, quality and security of supply	1. Research, development and technology dissemination 2. Information management 3. Production chains 4. Productive infrastructure and communications 5. Market Management
Development of Family Farming and Food Security	It has high economic impact on employment, and is very important in food production and in the domestic market supply. It also has a great social significance, since it has as subjects of policies poor families in the countryside than in any situation that are within the agrarian structure, corresponds the largest social sector of the country and where lack of opportunities is most remarkable for development, the axis of family farming assimilates the notion of adequacy of the agrarian structure with the aim of promoting a substantial reduction of poverty and improving the quality of life with emphasis on support for rural women. Access to land and the creation of appropriate conditions for establishment and economic and social consolidation of the rural communities of family farmers, in this sense, is an important issue in the current agricultural setting.	1. Access and management of agricultural properties 2. Rural Rooting 3. Incremento rural household income 4. Sustainable use of natural resources and development 5. Participation and development 6. Production of food

	consideration of all their potential. The development of environmental services introduces an innovative view of the forest as a productive multidimensional resource, which involves the installation in the sector increased commitment to environmental responsibility, a point underlined by the ASF. Thus, forestry development is driven by competition and proper use of natural resources. In this relationship between productive development and rational use of natural resources the state will play a key role of orientation and compatibility through public policy.	
Livestock Development	It is a specification of the general policies referred to production of meat of different breeds, of dairy and others, including family farming as an important productive segment in general. The items listed above acquire the same validity when it comes to farming and livestock production. It must be competitive with low unit costs, high productivity of the workforce and efficient use of energy.	<ol style="list-style-type: none"> 1. Research, validation and technology dissemination 2. Diversification of production and food production and animal health 3. Quality
Risk Management Associated with Climate Variability and Change	Derived from finding climate variability, which by its behavior, effects and projections, requires sustained interventions aimed at reducing uncertainty through the development of mechanisms for forecasting and risk mitigation, that at the time constitute more than technological options, a new management approach essential for a renewed, productive, secure, sustainable and competitive farming	<ol style="list-style-type: none"> 1. Institutional Management 2. Research and technology dissemination 3. Irrigation and Water Resources Management 4. Capacity Building 5. Access to tools reduction and risk mitigation

	<p>population. The employment is a result of the way the work is related with the other factors of production in a model in which private initiative comes first. As such, the incorporation of technologies and the promotion of innovation should impact positively on the level of wages. In addition, the quality of jobs and the development of regulations governing labor relations are advanced ways to improve the relationship between employers and workers. No doubt, that training and more general training in Paraguayan society will allow a more educated and more efficient work population.</p>	
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1.2. Implementations

As a conditioning element for the full implementation of the ASF, the sectoral institutional adaptation and modernization of MAG, both institutional and management support to drive change processes are necessary for the long-term comprehensive development of the agricultural and rural sector in Paraguay.

1.3. Coordination of Policy Framework

The current agricultural institutional complex is the product of an interesting process of changes in the structure of the sector. However, such changes have not resulted in an efficient driving system for the agricultural and for-

estry sector.

It should be noted, however, that the notions of autarky to lighten the load of MAG and enforce the decentralization and deconcentrating of functions as well as the condition of budgetary self-management, have had important effects on the development and performance on each of the institutions who entered that institutional definition.

By Decree of the Executive Power N° 169/2008 SIGEST, is created, INTEGRATED MANAGEMENT SYSTEM FOR DEVELOPMENT, and its objectives are: a) to provide and support the organization formulation and implementation and effective of the Sectorial Policies of Agricultural and Rural Development, and b) to establish a scope of coordination and operative interinstitutional complementation with territorial approach.

Main tasks:

- Define and install the Sectorial Policy Organization Framework as a guideline and operational matrix
- Promote inclusive, efficient, transparent and participatory sectorial management
- Supervise, coordinate and evaluate programs and projects of Agricultural and Rural Development
- Support the coordinated sectoral participatory planning and budgeting process

Figure 4-1. MECHANISM OF COORDINATION OF SIGEST



By Accord No. 19/2011 of SIGEST, it was agreed to strengthen the Departmental Interinstitutional Coordination Boards for the Agricultural and Rural Development (MECIDDAR), through the participation of the departmental heads of the constituent entities of SIGEST in the territorial-local level.

The MECID-DAR are territorial bodies made up of representatives of public institutions with functions in the field of agriculture by local authorities and representatives of social and grassroots organizations, and have been subject to different technical trainings on rural development with a territorial approach, importance of human capital and social capital, stakeholder participation and contributory agents to the development of the territories, creating budgets, consolidating the institutional framework of the officers, among others.

During 2014, the process was strengthened with joint efforts to work with MECID-DAR with the inclusion of the German Cooperation through GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) and the Sustainable Natural Resources Management Project (PMRN) driven by this cooperation and MAG / DEAg.

2. Institutional Strategic Plan 2014/2018

Approved by the Resolution MAG 2158/2014, it is a guiding institutional management which includes the development of processes that allow to analyze in detail the organization and place in terms of its environmental instrument, that is, determining the vision, mission, objectives, strategies, goals, and the roles and activities required to achieve the desired aims and purposes.

☐ STRATEGIC OBJECTIVES

- **Promote Agricultural Competitiveness for the Insertion of Agricultural Products into National and International Markets;** by institutional quality services with territorial and inclusive approach, actions tending to technological innovation in the production units, an updated agricultural education, availability of updated information related to the sector, promote to insert competitive products in the market, and to access new knowledge (biotechnology and biosafety) and the promotion of agro energy production alternatives.

- **Strengthen Family Farming;** achieving food security and its efficient integration into value chains to satisfy domestic demand and external market opportunities; through the implementation of different public policies, technological innovation in the production system of family farmers, expanding coverage of institutional quality services; right approach, with consideration of gender (strengthening the participation of rural women), generation, multi-culture and territory.

- **Strengthen the Institutionalization and Improvement of Operative and Administrative Processes;** through reform and reengineering; consolidation, strengthening and modernization of the institutions of the MAG (human talents, equipment and adequate infrastructure, among others), aiming at greater efficiency and effectiveness, to strengthen the MAG as a major player in the agricultural and rural development through definition and implementation of sectorial policies.

- **Promote and Encourage the Sustainable Use and Management of Natural Resources Such as Forest, Soil and Water;** through strategies of rational use and management of natural resources and instruments of risks management associated with climate variability.

3. Program for the Encouragement of Food Production by the Family Farming

It is an initiative that arose from the Ministry of Agriculture and Livestock (MAG), which focuses efforts and resources to ensure the availability of diversified food in quantity, quality and safety from family farming intended for consumption for family as the market, contributing to the improvement of nutritional status, quality of life and have a positive impact on the local economy.

The program includes the principles of social inclusion, Rural Youth, Sustainability, Subsidiarity, among others; and orders the supply of institutional services; technical assistance in organization, production, marketing; rural education; incentives dissemination.

It will be working with territorial intervention approach, focusing on specific groups of family farming and will be conducted within the framework of proper articulation and coordination with other technical, financial and organizational levels of the national and local institutions.

As a result of the implementation of the program, food availability of quality, quantity and safety in the farms and access to them, by increasing productivity, sustainable production, diversification, marketing and simultaneously strengthening human capital and social capital will be improved.

3.1. Objectives

- Increasing domestic production of quality foods
- Agricultural
- Livestock

- Promote access to these foods
- Family farmers themselves (self-consumption)
- Urban markets (marketing)
- Support community efforts related to socio-economic activities (organization, production technology, basic services, access, and marketing)
- Improve the income of the family members of the family farming through sustainable production
- Eradicating rural poverty

3.2. Target Population

1. Peasant families living in rural settlements of the country;
2. Communities of indigenous peoples;
3. Families in rural areas according to the targeting criteria of the Money Transfer Program with Stewardship (TMC) that are in extreme poverty; and
4. Other families belonging to the family farming sector through their organizations.

3.3. Achievements

According to the Annual Report 2014 Balance of Public Management, MAG, the main achievements were:

- Technical assistance to 93,703 family farmers and indigenous families; of which 41,952 families in 280 rural settlements; 38,131 organized families; 9,114 farmers of 60 micro-catchments organized in 455 committees

and 6,278 families of 200 indigenous communities.

- Support with 9,566 transfers to people of the family farming to implement technologies.
- 10,883 hectares were implemented by the Sustainable Management of Land Program and 1,094 hectares (reforestation) by forest management.
- 67 greenhouses built, of which 50 in biosafety conditions for seedling production of virus-free citrus HLB, with a total value of Gs. 1,450,000,000.

PROGRAM 1: PEASANT family farming AND RURAL DEVELOPMENT
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SUB PROGRAM5: SUSTAINABLE DEVELOPMENT OF THE EASTERN REGION
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The budget allocated to this subprogram amounts is around Gs. 8,841.601.810. of which Gs. 7.742.487.623.-were executed at the end of 2014 fiscal year

PROGRAM 6: DEVELOPMENT OF THE family farming AND FOOD SECURITY

SUB PROGRAM 1: AGRICULTURAL EXTENSION
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- The financial plan allocated to the program amount is planned to be around Gs. 30.599.918.413.- of which an implementation rate reached 90%.. The Directorate of Agricultural Extension (DEAG) is doomed to providing organizational, productive and commercial technical support to family farming with PRODUCTIVE CHAIN approach, based on agro-ecological zoning. Most of the producers and farmers assisted belong to family farming, where the workforce is predominantly from the family being its production essentially for consumption and income partially. In 2014, 30,808 (16,540 male farmers and 14,268 female farmers) received technical assistance through seminars, meetings, workshops, field trips, visits to farms, and expanded its capabilities in the following areas:
- 17,789 (10,197 male farmers and 7,700 female farmers) expands its capabilities: on conservationist production system; subsoiling use, rolling, tillage, crop rotation and association, the main planting seedlings fertilizers and their importance to restore soil fertility. Erosion control through contour practices; production of forest seedlings, fruit trees; production management vermicomposting and / or compost-insecticide liquid organic bio fertilizer, among others.
- 22,193 (11,501 male farmers and 10,841 female farmers) trained on Good Agricultural Practices (soil preparation, planting and proper density of the main items of consumption: cassava, sweet potato, peanut, corn, beans); family orchard and small animal management and post-harvest of basic grains.
- 18,365 (9,763 male farmers and 8,695 female farmers) trained on associative and commercial management (statutes, records, document management), production plan, business plan, joint marketing, IRAGRO, public procurement and others.

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- 12,213 (5,052 male farmers and 7,161 female farmers) trained on proper nutrition and healthy life: Dietary Guidelines Paraguay (GAP) healthy adults and children under 2 years, traditional food handling and preparation of food, craftsmanship of cleaning products, home environment improvement (latrines, oven, simple furniture)
 - 80 farmers qualified for the production of Yerba Mate.
 - 1,839 producers perform practices of conservative production system of soil (winter and summer green manure, tillage, crop rotation and association, compost and / or organic insecticide greenhouses installation, forest management).
 - 8,300 farmers have a family orchard producing essential vegetables (lettuce, cabbage, tomato, beet, green pepper, parsley and onion) to supplement family nutrition.
 - 87 farmers receive branch and seeds for 27 hectares, within the Katupyry Project frame.
 - 2,036 farmers perform Small Animal Health Management (poultry, pigs) and big animals (bovine cattle).
 - 21,111 farmers have at least 4 agricultural items for consumption.
 - 16,404 (9,544 male farmers and 6,990 female farmers) with expanded capacity in the production of cash crops: in sesame, cotton, Ka'a he 'e, tomato, cabbage, watermelon and others
 - 5 producers / trained on cultivation of Orchids
 - 18 producers / trained / as on technical production and marketing of Oregano
 - 21 producers trained on promoting flower production and cutting ants control
 - 1,915 committees in strengthening process, 203 committees recognized by the DEAg
 - 132 producers committees linked to local markets
 - 2,458 farmers perform varied recipes using products from the farm (breads, stews, sweets, etc.), improve their housing with the construction of latrines, traditional ovens, made in traditional way cleaning products (detergents, soaps, shampoo)
 - Recruitment and training of extension, viewing participation as follows:
 - 128 extensionist and 44 administrative hired workers serving at headquarters and the offices of the Farming Development Center.
 - 84 technicians part of in-service training where the following modules were developed: - Institutionalization, - Approaches and Methodologies of Rural Extension; - Sustainable production system.
 - 120 extensionists trained on farming conservation. Value chains; within the framework of the Co-management MAG-GIZ., in the departments of San Pedro, Paraguari, Caazapá, Concepción, Caaguazú
 - 108 extensionist trained on Promoting Good Agricultural Practice (GAP), use and management of pesticides and dissemination of laws and regulations on the subject with inherent activities related to rural extension vegetable production, Sovereign Bonds
 - 18 technicians qualified as general Beekeeping. Seasonal hive management, Winter - Spring. Using honey bee as school feeding
 - 22 technicians trained on crop management for pepper, tomato and cucurbits, 53 extensionists trained on digital rectal examination and ultrasonography. Production of milk and fodder seed varieties.
 - 36 technicians trained in safe food handling practices in food handling, food assessment based on farm products, government procurement.
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- 49 extensionists received technical guidance on tending to P / D coconut and spurge.
 - 90 technicians participated in the Updated Cotton Production System Workshop.
 - 30 extensionists participated in the Good Agricultural Practices Pilot Plan Evaluation Workshop and Development of Health Early Warning System on growing vegetables, fruits and flowers.
 - Technicians trained on the construction of wells and irrigation systems.
 - 10 extensionists trained on tailoring bedding cloth and kitchen, bakery. Canned fruits and vegetables. Validation of food guides to children under two years (INAN support)
 - 24 extensionists participated on courses, seminars and tours internationally on issues related to the work area.
 - 19 planners participated in the workshop in order to check and adjust the instruments of planning, monitoring and evaluation and implementation of Differentiated Technical Assistance. An instruction for implementing the Technical Assistance Differentiated developed.
 - 16 alliances signed with municipalities of Mayor Otaño, San Rafael del Parana, San Jose Arroyo, RI3 Corrales, Simon Bolivar, Cecilio Baez, Carayao, Coronel Oviedo, New London, La Pastora, San Joaquin, Mbutuy, Mauricio Troche, Bella Vista Norte, Carmen del Paraná, Ita.
 - Inter-Institutional Relations at National and International level with: - Latin American Network for Rural Extension Services - RELASER PARAGUAY with the participation of the Director of DEAg-in RELASER National Forum and an international event (GFRAS. Buenos Aires Argentina / involving a technician DEAg in RELASER: Uruguay) - Also there are partnerships with the following institutions: GIZ, IICA, JICA, FAO, KOICA, TECHNICAL MISSION OF TAIWAN, AECID, COOPI, ACH, National University of Asunción (Faculty of Agricultural Science / Faculty of Veterinary Science, SENACSA, IPTA, DINCAP among others.
 - MECID-DAR under development process with a territorial approach in the departments of Concepción, San Pedro, Caaguazú and Guaira and sensitized authorities for training instances, in the departments of Pte. Hayes and Alto Parana.
 - Territorial instances running in the departments of Itapúa and Caazapá, under the Katupyry Project.
 - Development Plan focusing on value chain to Yerba Mate, prepared with the Government of Caazapá

SUB PROGRAM 2: ENCOURAGING OF FOOD PRODUCTION BY THE FAMILY FARMING

- The aim of this priority program of the institution, which is framed within the National Program to Reduce Extreme Poverty "Sowing Opportunities", is to expand coverage increasingly up to 120,000 families who are in poverty or extreme poverty, strengthening their capacity to diversify their areas of consumption and income, through technical and organizational assistance. In this context the programs and projects involved in achieving the goal proposal are:
 - Agricultural Extension
 - Project Sustainable Rural Development. (PRODERS) Thus the goal of the subprogram is to assist 50,000 families and 300 micro finance projects.
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- The financial plan allocated to the program amounts to Gs. 30.734.606.856. with a 73.76% of financial performance
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- Achievements:
 - 41,965 families of family farming, with permanent technical assistance for the production, organization and marketing.
 - 30,680 work plans, which include food production on the farm.
 - 30,605 families have at least 5 food items on their farms of which 16,526 correspond to families headed by women.
 - Around 23,852 families effectively incorporated at least three or more production conservation practices on their farms.
 - Technical assistance was developed with 1,725 famer organizations, of which 1,446 are organizations that are minimally recognized by local municipalities.
 - Currently there are 28 active partnerships or cooperation agreements and others signed earlier in the implementation process, with municipalities, government and service sector institutions as well as institutions within the MAG and MAG system.
 - From 100 seed plots of maize installed at country level, 85,260 kg. Have been harvested, of which 12,440 kg., correspond to classified clean seed.
 - There was a support for the STP program Sowing Opportunities by raising 40,183 social chips, corresponding to the same amount of families.
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- Regarding - financing of investment projects, funds have been transferred to UNDP for Gs. 4.500.000.000.- which has been successfully implemented 93 improvements and productive home environmental projects with partners of the assisted organizations, eventually covering 2,025 Families
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- From 41,965 families distributed in the departments of San Pedro, Cordillera, Guaira, Caaguazú, Itapúa, Misiones, Paraguari, Alto Parana, Ñeembucú, Amambay, Canindeyú, Pte. Hayes. The main cause of not achieving program goals was the lack of technicians to carry out the planned activities.
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SUB PROGRAM 6: SOIL MANAGEMENT, CONSERVATION AND RECOVERING

- The Financial Plan allocated to the program amounts to Gs. 4.065.220.889.-, of which Gs. 2.406.194.055. have been executed at the end of the fiscal year, thus reaching the 59.19% of financial execution.
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- It has engaged in implementation of 476 plots of winter and summer green manure, 58 model farms (installation / implementation of winter green manure plots was performed with seeds of the 2013 Tender) on farms of rural settlements Use /validation of technologies in conservationist production systems. In addition, 5,377 farmers that participating 373 events have been trained and 1,182 technicians responsible for technical assistance, institutions, programs, and projects of agricultural development in the MAG and private sector. The main results are:
 - Institutional Coordination: coordination with 33 entities related to agricultural development; (MAG Program, PPA) (Cooperative; FECOPROD), (NGOs, IICA, JICA, Peace Corps, Social Pastoral, ALTER LIFE USAID), (MAG's Directorate; DEAg, Directorate of Marketing and Management) (Municipality; Natalio ; San Juan Nepomuceno, San Pedro del Paraná, Itakyry, Minga Guazú, Mayor Otaño) (Agricultural School; Concepción Ybycuí, Caazapá, Caraguatay and Villarica), (Local government of Itapúa, San Pedro), GIZ, INBIO USAID, INFONA, INDERT, IPTA, INDI, National University of Asuncion; Faculty of Agricultural
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Sciences from Caazapá and Catholic University from Cor. Oviedo and Maria Auxiliadora.

- Training of technicians responsible for assistance: 1,182 technicians from different institutions related to agricultural development.
 - Strengthening Productive Farms: 3,683 have been strengthened productive farms with usos of conservationist production systems. And conservation practices production have been implemented in 1,961 hectares, mostly covered districts of the Departments of Concepción, San Pedro, Cordillera, Alto Parana, Caazapa, Canindeyú, Guaira, Itapúa, Misiones, Paraguari and Ñeembucú.
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SUB PROGRAM 7: GENDER AND RURAL YOUTH

- The budget allocated to the program amounts is Gs. 123.667.872, of which Gs. 105.922.230.
 - The Directorate of Gender and Rural Youth has developed several activities in the year, which are listed below:
 - Workshop organized in the Framework of the Gender Inter-Institutional Technical Team (ETIG), composed by representatives of the Plans, Programs, Projects and Directorates of the MAG and independent organizations.
 - Workshop with 20 referents (10 women and 10 men) of CDA's as part of the reactivation of the 4 C Clubs, to provide technical guidance on the importance of agricultural clubs
 - Document Elaboration Workshop "Methodological Approach of Policies with Perspective of Rural Youth Gender" with institutional representatives in the context of the FAO Consultancy.
 - Document Validation workshop "Methodological Approach of Policies with Perspective of Rural Youth Gender "with institutional referents.
 - Participation of rural youth in the "1st National Congress of Rural Entrepreneurship". 50 free places, distributed among pupils and students of the Agricultural School of the DEA and the Agricultural DEAg 4C Clubs.
 - Establishment of 34 groups of young people through the CDAs in the framework of joint actions with the DEAg, 4C Agricultural Youth Clubs
 - Coordination and organization of the V National Forum agricultural leaders of Paraguay with IICA. 60 participants, 20 places for members of the 4C Agricultural Clubs.
 - XXII Specialized Meeting on Family Agriculture (REAF) GT GENDER HOLDER City / Country: Montevideo - Uruguay Date: 14 to 16 in October / 2014
 - Proposal of Establishment of ETIG and ETIJ, where it is proposed to unify and formalize both Interagency Technical Equipment Gender and Rural Youth, through Ministerial Resolution. Under the current agreement with the MINMUJER input delivery was made to Women's Committees in the Department of Itapúa, through the CDA Northern Itapúa DEAg, together with the local municipality.
 - Signed specific agreement about Youth Entrepreneurship.
 - 5 WORKSHOPS "CO-MANAGEMENT OF THE FAMILY FARM SUSTAINABILITY" in order to introduce and build the concept of participatory co-management of the family farm sustainability with technicians from MAG Coronel Oviedo, Dpt. Of Caaguazú, Caazapá , Dept. of Caazapá, Carapeguá, Dept. of Paraguari
 - Work desk with UNWOMEN and GIZ to organize the discussion group "Beijing + 20 Visibility to the role of rural women producing"
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- Work Plan developed jointly with the German Cooperation for Development (GIZ) (December 2014)
 - Participation in permanent work desk of the agreement with six institutions on Rural Youth Entrepreneurship together with the MAG, CAH, SNJ, MIC, MINMUJER, and MTE and SS. SUB

SUB PROGRAM 9: INDIGENOUS AGRICULTURE AND ECONOMY

- The budget allocated to the program amounts to Gs. 3.175.507.274.-, which has executed Gs. 2.908.899.987. thus reaching 92% of execution.

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- Achievements:
 - 3,954 indigenous families has been assisted in the Departments of Concepción, San Pedro, Itapúa, Guairá, Caazapa, Caaguazú, Alto Paraná, Canindeyú, Concepción, Pte Hayes and Boquerón, in the following areas:.
 - Training on production of consumption items: sweet potato, cassava, peanuts, beans, maize, peas, installation of family, community and school gardens.
 - Management of harvest and post-harvest of items produced and storage systems: perchel improved, drums and plastic drums, metal silos;
 - Production of alternative income crops Participation in agricultural fairs organized in the area for the exhibition and sale of their products;
 - Training fairground families in conducting fairs: product presentation, management, prices, other; implementation of agroforestry practices;
 - Management of native forests and Enrichment with Yerba Mate and fruit species; Installing plots of green manure and association of crops as innovation practices according to their production capabilities;
 - Monitoring and support to families in the production of different items.
 - Permanent training and monitoring for leaders of communities in the management of documents, project management and elaboration in different instances.

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- Outcomes:
 - 2,604 families assisted by PAEI have at least 4 items of consumption in production (cassava, maize chipa, Tupi maize, beans, home gardens), produce sesame, tupi maize and cassava for income.
 - Currently commercializing their products in the Mercado Central de Abasto (Main Market) (39,400 kilos of cassava) and the farm production fairs held in the districts.
 - 825 families implement some basic storage system for grain for consumption and seed.
 - 135 boxes installed for the production of honey for family consumption.
 - 756.5 hectares with soil conservation practices (green manure, farm without burning, crop rotation);
 - 435 hectares of forests enriched with yerba mate;
 - 17 installed ponds and fish production for family consumption;
 - 263 home gardens, 18 community gardens and school gardens in 16 communities.
 - one Association formed communities for joint marketing of its products in the department of Canindeyú;
 - 270 male and female leaders trained in community management.
 - 283 Social Housing Grant running, and 313 records made and 132 signed records to start implementing the construction of new homes in the department of Caaguazú,
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- SUB PROGRAM1: FARMING EDUCATION
<ul style="list-style-type: none"> • The budget allocated to the program amounts is Gs. 30.271.284.952, of which Gs. 27.924.271.715 was executed at the end of fiscal year 2014.
<ul style="list-style-type: none"> • Outcomes: • The Summary of the Annual Statistical of 40 main agricultural crops in the 2013/14 harvest, for which 300 survey forms were applied to organizations, silos, collectors and other public and private sector and annual agricultural surveys based on 3,500 interviewed and selected farmers, as shown in the CAN 08. • 4 Maps Departmental and District Geographical Location, and 3 (three georeferenced layouts at departmental level) In Georeferenced Settlement with support orthophoto maps and satellite imagery. • There are 16,081 new registrations in 2014, with a database of 196,460 producers of the family farming in the National Register of family farming.
PROGRAM 9: FARMING DEVELOPMENT
SUB PROGRAM 1: LIVESTOCK ENCOURAGING
<ul style="list-style-type: none"> • The budget allocated to the program is Gs. 3.290.668.492 of which Gs. 2,597,711,764 was executed during the current fiscal year equivalent to a 66.53% execution. • The following activities has been undertaken: • Training on good livestock practices for bovine cattle and small cattle (poultry, goats, sheep and pigs), fish farming (tutoring pond construction and management of fingerlings) and Beekeeping (Basic production of honey, derivatives and boxes manipulation). • Evaluation of technical capabilities and infrastructure for the approval of potential projects of livestock assistance.
<ul style="list-style-type: none"> • Regarding the beneficiaries of the program, are groups of farmers selected from Paraguari Department (Mbuyapey, Ybycui, Sapucaí and Caballero), Department of Presidente Hayes (Tte. Irala Fernández), Department of Caazapá (Buena Vista, Yegros and Caazapá). Poultry farmers from Caaguazú Department (RI3 Corrales, Carayao, Col. Oviedo and Caaguazu), Department of Cordillera (Arroyos and Esteros), Department of Paraguay (Ybycui). Fish farmers in San Pedro Department (Itacurubi of Rosario), Department of Paraguari (Quiindy) and Alto Parana (Minga Guazú). In Sheep and Goat farmers of the Department of Paraguari (Town of Acahay) and Department of Guaira (Yataity). In pig production to farmers from Paraguari Department (town of San Roque), and Department of Guaira (Itape)

4. Directorate of Support for the Family Farming

The Directorate of Support for family farming was established by Decree

No. 8,839, dated May 3, 2012, with the main objective to develop, establish and implement innovative financial instruments to support family farming that promotes improved production by implementation of sustainable technologies and sustainable (environmental, social and economic) development of the production unit of the beneficiary families engaged in agriculture and forestry. For the period 2014, the DAAF had a financial plan of Gs. 18,043,359,048, executed Gs. 9,662,474,888 representing 54% of financial performance.

Among the activities in the year include:

- Signing of the agreement between the MAG and UNDP called "Project Support for family farming ", which aims to improve the quality of life of family farmers, men and women who are living in poverty, through the access to services that promotes rooting, rising incomes and equitable and sustainable inclusion in the food industry complex. It is inserted in the strategy to combat poverty of the National Government. It will promote the strengthening of organizational, production and marketing capabilities of family farmers, supporting productive projects for sustainable food production and agricultural income items, increasing the level of adoption of sustainable agricultural technologies.
- The project has transferred Gs. 6.764.164.680. to the UNDP, in order to initiate activities.
- Through this Directorate deliveries of Kits Huerta Familiar (vegetable seeds, small tools) benefit to 194 organizations reaching 3,418 families was performed, in addition Poultry Kits (chicks, animal food, feeding and drinking) supported a total of 129 organizations and 2,166 families

were assisted, these two kits totaling 5,584 beneficiary families.

- As for greenhouse construction it is planned to perform 38 approved units, of which 8 units are already delivered, 6 greenhouses are in the Department of Concepción, in the districts of Concepción, Tacuara, New Fortuna, Vallemi, Tacuati and Yvyau, also 1 greenhouse in the Guaira Department Villarrica district and another greenhouse in the Department of Cordillera Itacurubi district of the Cordillera, other greenhouses are underway.
- Support to the Directorate of Agricultural Extension was provided with the Acquisition of Agricultural Machinery, sesame seed that benefit 200 families, mulching for 150 families of the Association of Strawberry Producers of Aregua in the department of Central was delivered, with the provision of vegetable seeds and small tools; 26 Indigenous communities totaling 823 families distributed in the departments of Alto Paraná, Alto Paraguay, Boquerón, Caaguazú, Canindeyú, Concepcion Guaira, San Pedro, Villa Hayes were assisted. Comprehensive Productive farms were delivered in full to 97 organizations from 7 departments (Caaguazú and Canindeyú, Concepcion Guaira, Villa Hayes, San Pedro) with a total of 295 families. Thus it was reached to farmers who receive permanent technical assistance, from the technical team of each area.
- As for the production planning, which totaled 1,800 families in the support for the adoption of technologies program, implementation was zero, and this is because of the reporting period the DAAF has not attended directly none of the families, yet it has done through the United Nations Development Program - UNDP, through the signing of the above men-

tioned agreement, which has achieved coverage of 8,804 families (3,138 male farmers and 5,666 female farmers).

5. Principal Institutions and Actors Participating in the Food Security and the Family Farming

The main institution responsible for agricultural policy, food security and rural development is the Ministry of Agriculture and Livestock (MAG), created by Law No. 81/92 that establishes the organizational and functional structure. The legal framework is complemented by MAG No. 1.863 / 02 Law "Establishing the Agrarian Statute" and Law No. 2002/02 "amending several articles of Law No. 1863-1802 Agrarian Statute".

The main actors of the agricultural and rural sector are:

- The Integrated Management System of Agricultural and Rural Development (SIGEST), created by Decree No. 169/2008 and regulated by MAG Resolution No. 356/08, aims to ensure consistency of content and organic and effective implementation of sectoral policies about agricultural and rural development, based on the guidelines of the Strategic Framework 2009-2018 Agrario. SIGEST core competencies are: i) to encourage and support the organic formulation and implementation of sectoral policies about agricultural and rural development, and ii) to form instance interagency operational coordination and complementation with a territorial approach.

- The National Institute of Rural and Land Development (INDERT), created by the law 2419/2004.
- The Executive Coordination for the Land Reform (CEPRA), created by decree n° 838/2008 * Law 904/81 establishes the Statute of Indigenous Communities and creates the Paraguayan Indigenous Institute (INDI).
- The National Environment System, the National Environment Council and the Secretariat of Environment (SEAM), created by the law 1561/2000.
- The National Service of Animal Health and Quality (SENACSA), created by the law N° 2426/2004.
- The National Service of Vegetable and Seed Health and Quality (SENAVE), created by the law N° 2459/04
- The National Forestry Institute (INFONA), created by Law No. 3464/2008, as an organ of application of Law No. 422/1973 "Forest" Law.
- The Paraguayan Institute of Agricultural Technology (IPTA) created by Law No. 3788, May 2010, as an autonomous legal entity of public law, which is linked to the executive power, through the Ministry of Agriculture and Livestock (MAG). It was a response to the progressive weakening of the traditional model to generate and transfer technologies in the Paraguayan agriculture.

The following State financing institutions complement the activities developed by the previously mentioned institutions:

- The Financial Development Agency (AFD), only second-tier banks of Paraguay, created by Law 2640/2005 and amended by Law 3330/2007.
- The National Development Bank (BNF), created by Decree No 281/1961, restructured by Law 2100/2003 and amended by Law 2502/2004.
- The Livestock Fund, restructured by Law No. 3359/2007.
- The Agricultural Credit of Grant (CAH) which was established by Law 551/1975.

☐ LAND REFORM

The National Institute of Rural Development and Land (INDERT) support Land Reform policy. By Decree No. 838 of November 12, 2008, the government created the Executive Coordination for Land Reform (CEPRA), as an instance of coordination between different institutions related to rural development of Paraguay.

☐ AGRICULTURAL EXTENSION

Agricultural extension services are one of the most outstanding needs of small farmers in the country, who expect to receive technical assistance to improve production and receive guidance on productive alternatives. Agricultural Census data indicate that about 80% of farmers receive no technical assistance in the necessary quantity and quality.

The provision of this service by the Directorate of Agricultural Extension (DEAg) under the Ministry of Agriculture and Livestock responsible for technical support services for small farmers.

There are also private institutions that provide technical assistance to farmers; the most remarkable are the production cooperatives, as well as some universities and NGOs, including the Social Pastoral of the Catholic Church and CECTEC (Center for Peasant Training, Education and Technology).

□ AGRICULTURAL EDUCATION

The MAG through the Directorate of Agricultural Education (DEA) offers agricultural training for youth and adults, men and women. In order to improve and professionally qualify for the development of rural areas with criteria of competitiveness, technical, economic and environmental sustainability, to improve the quality of life of the farming population. By Law No. 81 December 22, 1992, it becomes Directorate of Agricultural Education denomination holds to this day.

The Directorate of Agricultural Education tackles the integral formation of young people from rural areas (coordinated with the MEC), in matters of organization, production, marketing, application of techniques for soil conservation and educational outreach in the areas of influence of Agricultural Schools.

It is Agrarian Formal Technical Education (Technical-Professional Training in the levels of Basic Education and High School Education) that manages permanent training. It counts with 14 agricultural schools nationwide (9 under management of the MAG and 5 under the management of Local Governments). In addition, the DEA supervises other educational institutions managed by MEC and other private in their curricula.

Educational offerings are:

- Technical Agricultural High School Diploma (CBTA)
- Technical Agricultural Mechanization High School Diploma (TMA)
- Rural Promoter (PR)
- Rural Manager (AR)
- Agro- Mechanical Technician (TA)
- Technical High School Diploma on Environmental Sciences (BTCA)
- Agro-Mechanical High School Diploma (BTAM)
- Professional INITIAL (IPA)
- Modular courses for young men, women and family farmers in the agricultural sector

6. Multilateral and Bilateral Institutions of Cooperation and Financing Working in the Agricultural Sector

- **The World Bank** bases its actions on the Country Assistance Strategy, helps to mitigate the impact of the international financial crisis and is focused on supporting the Economic and Social Strategic Plan of Paraguay, particularly in the areas of: i) modernization of the state and public administration; governance; ii) equitable and equal opportunities for disadvantaged groups and iii) job creation and economic growth.
- **The Mission of the European Union (EU)** has established a framework of cooperation between the European Union and Paraguay. The priority sectors are: i) education, ii) integration of the Paraguayan economy into sub-regional, bi-regional (MERCOSUR / EU) and international (WTO) surroundings, and iii) cross-cutting issues such as human rights and

equality between men and women, the environment and institutional strengthening, and consolidation of MERCOSUR and strengthening the relations EU - MERCOSUR. Furthermore, protection of the rights of indigenous peoples will be guaranteed.

- **The Inter-American Development Bank (IDB)**, bases its performance on the document Country Strategy of the Bank with Paraguay. Work in areas of i) strengthening governance; ii) sustainable growth; and iii) reducing poverty and improving the quality of life of low-income population.
- **The Spanish Agency for International Cooperation and Development (AECID)** has established that the objective of the Spanish Cooperation in Paraguay is to collaborate with national efforts and other international cooperation agencies to promote poverty eradication, sustainable development, equity, social cohesion and respect for ethnic minorities in the Republic of Paraguay.
- **The United States Agency for International Development (USAID)** designed to address some of the problems and challenges facing the development process of Paraguay. The strategy integrates environment, reproductive health, and economic growth initiatives. The US government channelizes most of the technical and economic assistances to Paraguay through USAID, which supports the Paraguayan government, civil society and the private sector, to consolidate democracy, protect the environment, improve health services and promote economic development by creating jobs.

- **The Japan International Cooperation Agency (JICA) and the Japan Bank of International Cooperation (JBIC).** JICA office in Paraguay, works based on a development plan for Paraguay program with the following objectives: i) assistance against poverty; ii) economic and social development; iii) governance; and iv) environment and climate change. The main programs in Paraguay are: i) improvement of social service aimed at people with limited resources and maintaining and increasing of income, ii) strengthening of economic competitiveness to boost growth and mitigate inequalities in the framework of MERCOSUR, iii) preservation of the environment and sustainable development and iv) improving of administrative system (Good Governance).
- **The Canadian International Development Agency (ACDI),** performs the role of supporting sustainable development to reduce poverty and contribute to a safer, more equitable and prosperous world. ACDI believes that the Southern Cone countries need oriented priority areas for development, such as good governance, public sector reform, economic integration and environmental protection cooperation.
- **The Korea International Cooperation Agency (KOICA)** establishes that the official development assistance of the Republic of Korea has three types of operations: 1) bilateral donations, 2) bilateral loans, and 3) multilateral assistance. Bilateral grants include technical cooperation and transfer non-refundable. Bilateral loans are granted on concessional terms under the terms of the Economic Development Cooperation Fund (EDCF).
- **The Inter-American Institute for Cooperation on Agriculture (IICA),**

it works in the areas of: i) permanent monitoring of national and sectoral reality to identify new demands for technical cooperation, ii) permanent dialogue with the institutions and national authorities in the agricultural public and private sector, ii) teamwork with the different operational units of the Institute to optimize the satisfaction of requests for technical cooperation and logistical support to the country, and iii) strengthening strategic alliances with financial institutions that support agricultural development and the national bodies responsible for managing the implementation of projects.

7. Conclusions

- There are tools for planning and operating assistance to family agriculture. There is an effort from the MAG to have institutional and inter-sectoral cooperation bases.
- The focus of assistance is focused on the territory and territorial zoning of production, but the levels of coordination with other government institutions are weak, therefore comprehensive assistance is reduced.
- There are efforts towards family farming, seeking to strengthen farmer organizations, training of rural youth and the introduction of new technologies for small farmers.
- The MAG identifies and develops strategic alliances with international agencies, nongovernmental organizations and independent agencies to

improve service coverage for family farming.

- There is continuous work on the implementation of workshops and seminars on the problems of family farming, seeking to improve interagency coordination processes and methodological tools for comprehensive care for rural families.
- The MAG transfers economic resources to other international organizations in order to implement certain programs for the family farming, which demonstrates the lack of technical resources for planning and implementation of these agencies. In several chapters of its annual report, the MAG talks that certain objectives could not be implemented due to lack of technical human resources, for assistance to farmers.
- The greatest strength of programs and projects rely on the technical assistance, economic support to families and in implementing technological improvements, including irrigation systems, construction of greenhouses, agricultural machinery, etc.
- Programs and projects related to agricultural research for the family farming are reduced, as technological innovations are concentrated on specific crops and not on the production system.

Chapter 5

The Evolution of the Farming Extension in Paraguay

1. Evolution of the Technical Assistance for The Small and Medium Scale Paraguayan Farmer

1.1. First Phase (1950s - 1960s)

According to ID- "STUDY for PROMOTION of IMPROVEMENT of LIVING ACTIVITIES in PARAGUAY" 2013; The Service of Agricultural Extension and Livestock (SEAG) was established in 1951 as a body under the Ministry of Agriculture and Livestock (MAG). During that year, prelimi-

nary studies were conducted and directed the effective management, administration and operation for as part of a technical cooperation agreement signed with the Government of the United States.

The aim of the SEAG was to operate in rural areas and transfer to the farmer and his family and thus raise the living standard of the rural population. To achieve this purpose, in November 1952, the first extension agency was set up in the town of San Lorenzo and four agencies were set up in Cnel in 1953 such as Oviedo, Eusebio Ayala, Encarnación and Carapeguá. In 1954, 10 agencies were operating.

In subsequent years were gradually establishing new agencies, and the total number of agency was 22 by 1966. In 1967, the SEAG was transferred to the MAG, with all staffs and operates as a division of the Department of Agricultural Development.

It is known that the first period of the Agricultural Extension in Paraguay, between 1952 and 1967 runs which was funded and managed by the STICA. During that time the principles, rules and strategies were based on the experience of U.S extension. There was administrative autonomy and the financial resources were adjusted to the requirements of the plans and implementing programs.

The establishment of extension agencies in the fifties had an organizational structure composed by extension Agent, which the technician was working with farmers, the home enhancer working with women, and 4-C agent who worked with the youth. For the incorporation of extensionist and home enhancers, public calls for merit and skills are made. In the case of the latter,

it was requested to regular teachers studied in home economics, craft and / or dressmaking.

The selected staffs, both the extensionist and the home enhancer, participated in, so-called, Pre-service courses whose average duration were between 2-3 months and was implemented at the Veterinary Service. They were trained on issues related to the organization of the Ministry of Agriculture and Extension Service, as well as its activities and extension methodologies and technology transfer.

1.2. Second Phase (1960s - 1970s)

In 1969, the SEAG was ascended to the category of Department under the General Directorate of the MAG. In the same year, a vice Director was designated and three more local agencies were created, reaching a total of 25 across the country. Each supervision was composed by a supervisor of agricultural agents, a supervisor of home improvement and a 4-C zonal leader. In 1970, the Department of Agricultural and Livestock Extension passed under the Directorate of Rural Research and Extension (DIER). FAO document and the Technical University of Berlin (1971) revealed that the SEAG had a high credibility in the field at that time. A survey of farmers by SEAG showed that 45.45% said they went to an Extension Agent for advice, while 19.12% to neighbor and 15.36% headed to the Officer of the National Development Bank in case of problems on his farm.

During the 1970s, Paraguay received funding from the Inter-American

Development Bank (IDB) for the implementation of the Integrated Project for Agricultural Development of Paraguay (PIDAP I). The loan was approved in 1971 and remained in force until 1975, for USD 25 million. This loan allowed the improvement of existing research and extension facilities and training of many of the staffs of DIER, through postgraduate courses abroad and other training short-term courses. According to the annual reports of SEAG, in 1973, there were 23 home educators, reaching 33 in 1977. The ratio of home educators regarding extension agents was 1 in 3 in 1975, 3 in 8 in 1976 and 1977, 1 in 3 in 1978 and 2 in 7 in during 1979. The search for technical and administrative improvement of SEAG, prompted the Government to take steps to request the support of international organizations, technical support, getting support from UNDP / FAO-PAR / 73/003, which provided the assistance of Spanish and Brazilian experts, with whom the policy and strategy of extension work was established for this new stage.

1.3. Third Phase (1980s)

During the eighties, the SEAG had important resources through the implementation of various development projects - some of them with international funding - which allowed it to expand its coverage and attend most of the eastern region of the country and three districts of the Western region.

Table 5-1. EXECUTED PROJECTS IN THE 80's

Paraguarí, Itapúa, Cordillera, Central, Ñembucú, Misiones and Caazapá where through CRDR and local agencies, technical-education coverage to farmers and their families were provided for 54 districts of the country.

➤ **Colony Consolidation Project (Canindeyú-Alto Parana):**

It was generated with the settlement and enabling of the colonies in the area of Alto Parana-Canindeyú. The MAG through SEAG plays an active and important role in the transfer of technology to rural farmers and their families. The project covered 17 colonies in the area.

➤ **Integrated Development Project (PARAGUARÍ):**

It aimed to promote and perform a set of actions and aimed at overcoming the constraints and socio-economic deficiencies that affect a wide area in Paraguarí Department, by integrating directly productive components of support for production, physical infrastructure and social services.

➤ **Integrated Rural Development Project Northern Area (GERMAN MISION)**

This project is under the support of the German Technical Mission with the MAG, through the SEAG and the German Society for Technical Cooperation. The project objectives were: to generate, evaluate and disseminate agricultural production techniques; facilitate access of small and medium scale farmers to a better living standard through the rational production and marketing of their products; and encourage farmer participation in self-help organizations. The geographical area covered districts were Chore, Cruce Liberacion Guayaiby and Jhuguá King

➤ **Integrated Agricultural and Livestock Development Project in Paraguay (PIDAD II):**

It was executed under the agreement between the MAG and the BNF, providing training in choosing best production alternative and credit for the development of farms, contributing to better use of human, financial and materials available resources. The project covered the departments of Concepción, San Pedro, Caaguazú, Guairá and Caazapá

➤ **Integrated Rural Development Project (Iptua-Eastern Area):**

This project was funded by a World Bank loan, and included a Credit Program for farm financing and capital increase for farmers. The geographic area included the departments of Caaguazú and Alto Parana.

➤ **Integrated Rural Development Project (Iptua-Northern Area):**

The SEAG executed the share of the Educative-Technical Assistance. The project objectives were: to increase production and productivity of farms by implementing new production techniques; increasing the production of health by improving nutrition, environmental sanitation and improved houses; improve the operational capacity of the institutions responsible for the project.

Under the Project for Small Producers Technologies (PTPA) institutional reform plan was implemented. Regional Center for Rural Development (CRDR) units with a strategic geographical location as operational bases of the project and received physical and economic resources was created in order to support the activities of the appended agencies to each CRDR. The

team of the regional centers was composed of about twelve (12) officials, including: 1 head of Center, several specialists (agriculture, communication, planning and evaluation, beekeeping, home education, agricultural economics), an administrator, 1 librarian and 1 secretary. In this way, a decentralized administrative structure was established, applied research activities in support of technology were encouraged and programs of technical diffusion services were improved with the introduction of methods of group communication.

In 1986, the Agricultural Extension Service Livestock (SEAG) was promoted to the category of Directorate. The Annual Report 1983 from SEAG, realizes that 10,091 partners, member in 372 clubs in that year were assisted. It also indicates that 91.7% of clubs were mixed (wives and daughters).

In subsequent years, these housewives' clubs became Women's Committees and the organization was perceived as a mean to "reach more people with less cost, facilitate the exchange of experiences and promote mutual support among women". Considering the influence of women in rural development, it tried to give a different content to the actions from a more comprehensive perspective of the women status, incorporating the gender approach in the activities. The presence of women in farmer committees was encouraged in order to give experience to family involvement in rural development.

In 1983, the sub-division of home education of SEAG worked with 81 extension agencies, with 59 Paraguayan home educators and 22 Peace Corps volunteers from the US. All functions tending to promote, increase, strengthen and develop actions with the wives and children of farmers help them

to improve the quality of life of rural families by incorporating them into the national development process. In this period, the proposed SEAG developed specific aspects of rural development with a broader approach. Complementing the actual functions of the educator it is emphasized with the agronomist in their activities at the level of rural agencies.

By the late eighties, the SEAG promotes projects aimed at rural women, who were characterized by low coverage and "experimental" working methods. "The Role of Women in Rural Development" (1986/1992), Project turned its efforts towards rural women, organized into housewife clubs. In coordination with the Ministry of Health and the Role of Women Project, improvement of latrines, installation of sanitary ware and raised stoves were promoted.

1.4. Fourth Phase (1990s)

In 1992, the SEAG became Directorate of Agricultural Extension under Secretariat of Agriculture of the MAG. At the same time, its organization and operation were restructured. In that period, the development projects promoted by the MAG set the new priorities and areas of intervention and support the emergence of new actors in rural development that prompted new institutional arrangements for technical assistance and rural extension. Urban and rural poverty that had been growing in the countries began to manifest itself more strongly from mid-80s and worsened in the democratic transition of the 90s.

Two issues that have impacted significantly on the organization of extension

services and life improvement during the decade of the 90 were: i) the subject Women and Gender, which influenced the institutional structure by changing the form of technical extension work and educators from home, yet influenced the traditional idea that training for economic works shall be provided to men, and training for domestic work to women; and ii) outsourcing programs of technical assistance that were driven from the second half of this decade.

Major projects aimed at improving the living standards of rural women in Paraguay began; and in 1993, the Division of Education for Home was raised of category with the creation of the Women Promotion Department, trying to focus its objectives to a more comprehensive view of the status of rural women and incorporating the gender approach in the institutional activities.

The DEAg includes the priority topics such as gender, reproductive, health, earning capacity and participation issues. As the income grows for the family, a strong consolidation of the group and demand for technical support from the SEAG in other communities has occurred.

Many activities focused on the management and distribution of school lunches. Women worked in the fundraising that were reinvested in improvement for educational facilities and school kitchens and equipment, stoves, food storage, wiring and orchards.

1.4.1. Outsourcing Of the Technical Assistance

In the nineties, the Agricultural Development and Forestry Modernization

Program started (PROMODAF). By 1995, the Diagnostic Project V of PROMODAF identified a number of institutional constraints from the DEAg concerning the lack of appropriate technologies, the multiplicity of functions and the lack of proper planning.

As in other Latin American countries, reducing the executive function of the State and the transferring responsibilities to the private sector and local authorities were encouraged. The DEAg began to lose its leading role in rural development. On the meantime, key development programs that incorporated other extension models were promoted.

In 1995, MAG launched the "Natural Resource Management" Project through a loan from the World Bank to address the decentralization of services and assistance to the farmers comprehensively, considering economic, social, environmental and institutional policies.

In addition, the MAG agreed with the Inter-American Development Bank (IDB) in actions of assistance outsourcing, and these were initiated in 1997 as part of a Pilot Component of Rural Settlements Consolidation Project, expanding to 2000 through the Program of Support for the Development of Small Cotton Farms (PRODESAL).

The Credit Project in the Eastern Region, financed by IFAD, drove tenders for technical advice through individual consultants and subsequently the Natural Resources Management Program, co-financed by the KfW. For its part, the DEAg faced severe budget cuts that limited their field performance and numerous extensionists with vast experience left the institution in search of better employment options.

Table 5-2. OUTSOURCING PROJECTS

Natural Resource Management Project	It suggested the provision of rural extension services based on micro catchments; with public and hired technicians; implementation of operative regional units devolved and decentralized, and the establishment of operative complementation mechanisms between the MAG, municipal governments and neighborhood committees. This project assisted about 12,000 families.
Program of Support for Small Scale Cotton Farms(2000-2004)	It suggested hiring Outsourced Technical Units (ETTs) working in geographic areas not assisted by the DEAg. Overall objective was to promote the sustainability of small cotton farms production systems, generating income by reducing costs with the use of integrated pest management, increase productivity through improved seeds and improve environment through a reduction in pesticide use. PRODESAL assisted around 20,000 families
CREDIT PROJECTS IN THE EASTERN REGION (1996-2004)	It involved the implementation of the components of: a) Rural Financial Services, b) Technical Assistance Services, to assist financial intermediaries (mostly cooperatives) in the management of its financial services, and partners in production and marketing and title to their lands. This project assisted 5,000 families

1.4.2. Rural Techniques from the 2000s

This period is characterized by great instability within the MAG as a result of the creation of numerous independent agencies, changes in the policy, and the drain and lack of human resources. The completion of three major development projects by 2004, generated a significant decrease in the coverage of the technical assistance provided by the MAG, from around 75,000 assisted families to only 33,000.

To remedy this situation, during 2004 and 2005, MAG launched the joint program known as the PATIDAF (Integrated Technical Assistance family

farming Program) which allowed the hiring of additional technicians via public tenders, payment of wage supplements and bonuses to extension agents and the provision of operational resources for DEAg.

In 2005, under the coordination of the Vice ministry of Agriculture and the General Director of Planning, Reengineering of the DEAg was considered to strengthen departmental instances and partnerships with local governments, cooperatives and private companies. Farming Development Centers (CDAs) were created to replace the Zonal Supervision, and functions of the new facilities were expanded. The figure of specialists in each department was re-boosted (initially promoted in the 80s by the PTPA) to provide technical support to IFAD. In later years, new action and investment programs to be managed and implemented directly by the DEAg were designed, and maintained by institutional budget.

The priority topics were turned towards food security, production of income and consumer demand, the Management of Production increase and the promotion of agribusiness. Actions related to income increase and consumer demand and marketing of agricultural products were prioritized.

From 2011, DEAg has introduced its Operative Plan, a new field called Living Standard Improvement as part of the activities developed by extensionist and rural technicians. This field is evaluated by the Directorate of Planning and DEAg it consists on the following components:

- 1) **Food and Healthy** to promote health through nutritional education, through rational and appropriate use of food, including production, processing, handling and food storage.

- 2) **Family Resources** to support family development with the resources available on the farm to generate income.
- 3) **Improving the Household** aims at encouraging a healthy household and community work; and guidance on a) Personal and house hygiene; b) Healthy environmental habits; c) Importance of community work for the disposal of waste and protection of water sources; d) Development of cleaning products that support the adoption of healthy hygiene habits.
- 4) **Family and Social Coexistence** covers human rights and child; human trafficking; redistribution of domestic responsibilities; relationships and roles of members.

1.4.3. The New Guidelines

In the AGRICULTURAL STRATEGIC FRAMEWORK 2014 - 2018 (ASF), it states that the purpose of equity, the policy framework should incorporate different formulations that address the necessary specificity, regional approaches to certain social and productive groups or in respect of specialized services and programs aimed at certain specific sectors or regions (agricultural extension, agricultural education, finance, roots, irrigation, etc.) The ASF poses a strategic focus on sustainable agricultural and rural development under a territorial approach, which in turn promotes national development within the country, and efficient way to integrate competitiveness, participation, equity and environmental respect.

The ASF includes as one of its strategies the Strengthening generation and dissemination of agricultural technology services, where one of its goals is - Strengthen public extension services to improve technical assistance and

the quality and coverage of promote the establishment of public-private partnerships to facilitate the adoption of appropriate technologies by farmers. A strategy on the growth in family income aims at promoting sectoral organizational adjustments that integrates with system vision, research and agricultural extension focused on the family farming. In the area of sustainable use of natural resources, it aims to strengthen the dimension of environmental management in the contents of research and agricultural extension. At the present, a wide range of official training programs offer mainly for employment, but not for entrepreneurs.

The current agricultural institutional complex is the product of an interesting process of changes in the structure of the sector. However, such changes have not resulted in an efficient driving system for the agricultural and forestry sector. It should be noted, however that the notions of autarky to lighten the load of MAG and enforce the decentralization and deconcentrating of functions as well as the condition of budgetary management, have had important effects on the development and performance of each of the institutions.

However, if the institutions are observed as set, many deficiencies are detected: i) the definition of competencies, which in some cases are juxtaposed with the MAG, ii) the functions insufficiently harmonized and iii) a scheme of hierarchical relations are not organizational. Therefore, this set of institutions and the relationships they establish are not form as a system, even in the most basic version of what is meant by the system.

1.4.4. Reflections on the New Extension

The current functions of the extension, beyond technical change have to do with the fact of becoming an instrument of public policy against the social inclusion and exclusion in rural areas. The new extension should prioritize the use of knowledge for the purposes of social inclusion, inclusive and transparent access to productive resources in rural areas. It has an approach that regarding provides opportunities and participation for social classes that requires it.

Promotes links between public and private actors, it helps to correct market distortions and accountability based on monitoring and evaluation. It continues with the effort to link research and extension, viewed as a single process. Some issues of consensus on the current extension services:

- Insufficient means of measuring for the resources destined to the extension.
- Its service has become quite invisible, unlike research centers.
- The small scale agricultural production fails to take a step ahead; for this reason, it needs partnership among each other.

With this, some elements of a new extension may arise:

- Using the knowledge for the purposes of social inclusion (cognitive ability, resulting in products or services and information as a social good).
- Inclusive and transparent access to productive assets (natural, physical, financial, human and social capital).
- Attention to regional and local demand.
- Encouraging quality through competitive funds (the extension service providers compete with each other). Outreach activities are most effective when farmers are directly involved in defining, managing and adopting them.

- Participatory approaches.
- Greater connectivity and coordination between public and private actors.
- Approaches network of professional services.
- Accountability-based monitoring and evaluation.
- Continuous improvement of extension-based virtual training tools.

Agricultural extension faces the accomplishment of its new duties by a facilitative approach: technical support, administrative support, social support (especially equitable access to food, housing, health and education), support to meet environmental requirements, political and institutional support.

Chapter 6

The Evolution of the Farming Research in Paraguay

1. Evolution of the Farming Research

In Paraguay, agricultural research began with the creation of a private research station in Yaraguazapá, in 1887, the Agronomic Station in Puerto Bertoni in 1894 and the National School of Agriculture (ENA) in Trinidad in 1896. The Directorate of Livestock and Meat Inspection was established in 1917, and in 1924 the Department of Plant Defense and Plant Health Police, which was the background of MAG. In 1923, the Division of Agriculture and Agricultural Defense with the objective of promoting cotton, snuff and other strategic crops are created.

Twenty years later, the Inter-American Technical Service for Agricultural Cooperation (STICA), a US government agency, created the National Agronomic Institute (IAN) in Caacupé and the Experimental Station in

Caapucú Barrerito. IAN focused its research on crops, pastures, and livestock.

In 1953, a second experimental agricultural farm in Capitan Miranda, Experimental Farm is created. The latter was renamed the Regional Center for Agricultural Research (CRIA) in 1970 and focused its research on fruits, soybeans, maize, cotton and wheat. The Ministry of Agriculture and Livestock (MAG) was created in 1950 but started its research until 1966 when the ministry was restructured and the responsibilities of STICA were transferred to the newly created Directorate of Agricultural Research and Rural Extension (DIAER). Among other activities, the DIAER had two individual research programs, one for crops and forestry, and other for livestock. Crops and Forestry Program of the DIAER had focused on 10 products (oilseeds, fruits, vegetables, wood, cotton, wheat, snuff, meat, and milk and industry oil seeds); in 1969 it was restructured and renamed Directorate of Agricultural Research and Extension and Forestry (DIEAF). At the same time, the livestock program of DIAER was renamed National Program for Livestock Research and Extension (PRONIEGA) and was released after a cooperation agreement between the US Agency for International Development (USAID), and the MAG.

The introduction of modern technologies was achieved, thanks to the consolidation of various networks of local innovation. Currently there are six types of agents that generate and validate agricultural technologies in Paraguay: such as farmer organizations, international agencies, international research institutes, institutes of the Ministry of Agriculture and Livestock (MAG), the private commercial sector, and NGOs

Public research institutions' operational capacity was affected even more in the 90s because of budget cuts, instability in the economic, social and scientific policies and the lack of investment in human and physical capital. In addition to structural limitations, the style of management of public research agencies makes them heavy and centralized, bureaucratic and excessively with little outreach to the private sector and local and regional governments (Rodriguez Ferreira, 2000) entities.

Until the late 70s, most of the research on experimental farms was not conducted, within an institutional framework that organized. Work on farms were organized on specific projects of traditional crops or livestock, but lacked a systemic vision of agricultural production.

The reduction of public research funding and private companies' demand for trained personnel induced migration of these scientists to the private sector, which came to occupy management positions. The public system of agricultural research followed the guidelines defined by the executive branch, characterized by paternalism and centralization. Thus, the system focused on promoting a few income crops for farmers such as cotton and snuff by setting specific national programs.

Research institutions, and credit extension were strengthened and technical staff were trained in the disciplines prioritized national programs.

Approximately 80% of the resources of public institutions were intended to promote the priority areas; but as promotion programs were formulated with limited participation of peasant organizations, the impact on farms was limited (Rodriguez Ferreira, 2000).

Although the strategy of production support by national programs for the promotion of crops has become less important. In a few cases still there are technical teams comprising representatives of public and private sector (Dietze 1999).

After several transformations in 1992, the structure and functions of MAG were defined. Until 2000, its function was to regulate and control the safety and quality of agricultural and forestry products, promote forestry development, preserve natural resources, support the peasantry, conduct market research on agricultural products, systematize and disseminate market information, generate and transfer agricultural and forestry technologies, agricultural education and rural extension. But the legal framework and reduced management capacity did not allow it to fulfill this broad mandate (Rodriguez Ferreira, 2000).

Among the users of agricultural and forestry technologies there was a perception that the activity of MAG is scarce and is divorced from the needs of users with little generation of results, low coverage of technical assistance and little specialization (Government of Itapúa, 1998).

With the State reform, the research activities in the field of the Ministry of Agriculture were organized under the Directorate of Agricultural Research (DIA) and Research on Animal Production (DIPA). In 1999 the DIA had nine experimental fields. Research activities within the DIA program are organized by crops, which in turn are structured by areas specific such as breeding, agronomy, plant protection, etc.

The (IAN) National Agronomic Institute and the Regional Center for

Agricultural Research (CRIA) are unique within the public sector with adequate infrastructure to maintain long-term research programs. The rest of the units are mainly concentrated in the validation of imported technologies. Because of the serious budget limitations of the public sector to fulfill its mandate, in the early 90s, the authorities of MAG and the IDB conducted several researches to identify institutional problems of the public sector related to agriculture, with emphasis on the MAG. Later, this initiative became the Program for Modernization for the Development of Agriculture and Forestry Sector (PROMODAF), which became part of the State Reform Plan.

In the area of science and technology, PROMODAF envisaged the creation of the Paraguayan Institute of Agricultural Technology (IPTA), an autonomous entity with decentralized units in various agro-ecological areas of the country. Political problems delayed the implementation of the Plan, which, at the time of writing was being implemented slowly (Dietze, 1999; Rodriguez Ferreira, 2000).

The Japanese community played an important role in the creation and development of agricultural research centers, as technical assistance centers in Pirapó³. In addition, Iguazu and La Paz were created to support farmers from the beginning. These centers then formed the Agricultural Technology Center of Paraguay (CETAPAR), funded almost exclusively by the Japan International Cooperation Agency since 1985 (JICA).

Even though CETAPAR is a small organization, it has had a great impact in rural areas. One of the responsibilities for CETAPAR is introduction of soy; it has also varieties and hybrids of vegetables, such as the Luna

Yguazú melons and Super CETAPAR tomatoes.

Meanwhile, cooperatives and associations of farmers maintained technological development programs that did not require large investments in infrastructure or highly qualified scientific personnel. However, more sophisticated research, depends on Brazilian or developed countries institutions (Ekboir, 2001).

The major farmer's associations are FEPASIDAS, the Livestock Technology Center, Livestock Consortium for Agricultural Research (CEA), the Regional Consortium for Agricultural Research (CRIA) and the Rural Association of Paraguay (ARP). The ARP organizes an annual agricultural, commercial and industrial expo for MERCOSUR. In the mid-90s, the ARP, associated with the MAG, financed the installation of pilot farms in rural settlements (Rodriguez Ferreira, 2000).

In addition, the ARP has its own technological programs, and maintains a network of regional branches to facilitate technology exchange among its members. This organization is a major actor defining policies for the productive sector (Rodriguez Ferreira, 2000). Farmer's associations have mainly served their partners, i.e. the commercial farmers. Technologies for small farmers have been developed by international aid agencies or NGOs, sometimes interacting with individuals from public research institutions or extension.

Examples of these efforts are the Soil Conservation Program, implemented jointly by the MAG and the GIZ, who developed direct seeding technologies for small farmers, and Alter Vida NGO that promotes organic vegetable pro-

duction and forest management activities aiming at small scale farmers. The international research institutes, especially CIMMYT has collaborated with public institutions, international cooperation agencies, cooperatives and farmer associations, especially in the provision of germplasm adapted to the ecological conditions of Paraguay, supporting public breeding programs and, to a lesser extent, in the development of crop management technologies.

2. Operative Capacity of the Public Research System

In 1996 a total of 158 researchers (full time), only 4% of Paraguayans had doctor degree, while in Uruguay this proportion reached 35% and 49% in Colombia. In particular, from the 80's IAD had only a professional doctorate (MAG, 1997). In addition to the weakness of the plant of researchers, public research system is characterized by a high proportion of administrative and support staff.

The public accounts recorded only scarce contributions from the central government, but the vast majority of operational funds and salary complementation come from international aid agencies, international institutions, private companies and farmer associations.

Although there is no data on the contributions of the institutions, the resources provided are essential for the functioning of the public system. In 1996 public expenditure on research accounted for 3.75% of the MAG budget (MAG, 1997). During the 90s, most of the funding came from DIA national government budget allocations. The revenue generated by sales of

seeds and services to farmers represented a relatively low percentage, between 5% and 7% of the total resources available. In 1996 the intensity ratio was only 0.19% (IFPRI, 2001).

The public research system was focused on a few institutes funded by international cooperation agencies (p. Eg. CETAPAR), institutes of the DIA. The latter was organized in product-specific programs and these, in turn, by scientific disciplines, which hinders multidisciplinary research and developing research activities with an integrated vision of the farm.

Research activities at universities are extremely weak due to lack of dedication of teachers and the lack of resources and infrastructure. The experience of developed countries shows that is possible to create an efficient innovation system in which universities are not research institutions but essentially teaching (Ekboir and Parellada, 1999)

3. Trends Regarding Farming Research after 2000

Due to the relatively late introduction of a formal structure of S & T in the country compared with other countries in South America, Paraguay now lags far behind its South American counterparts in terms of expenditure on R & D (agricultural and non-agricultural). In 2005, the country invested USD 7 million in R & D (agricultural and non-agricultural), ie barely 0.09 percent of its GDP. (ASTI country Binder # 40 - December 2008).

This percentage has not changed much over the period 2001-05. However,

neighboring countries such as Brazil (0.82 percent), Argentina (0.46 percent) and Chile (0.68 percent) invested a higher percentage of its GDP on R & D in 2005. (ASTI country notebook n° 40 - December 2008).

In fact, Paraguay ranks second to last in South America, just ahead of Ecuador (0.07 percent) in spending on R & D (RICyT 2008). Due to the recent creation of CONACYT, and a notorious support from the IDB, is expected that the Paraguay GDP's percentage invested in R & D increased slightly in the future. However, the country has a long way to go if it wants to be in line with its neighbors. (ASTI country Binder # 40 - December 2008)

Compared to other fields of science, agricultural science and technology is an important part of the overall S & T performed in Paraguay. In 2005, agricultural science and technology sector of the country occupied 35 percent of total S & T staff of Paraguay, for 31 percent in 2001. However, in 2005, social sciences and engineering occupied 16 percent each, and the natural sciences and medicine by 15 to 11 percent of total S & T personnel, respectively (RICyT 2008).

In 2006, this directorate employed 64 SED researches, ie half the agricultural research capacity in the country. The IAD headquarter was located in San Lorenzo, 11 kilometers from Asuncion, capital of Paraguay; headquarter harbors the national director and four departments: the department of planning, monitoring and evaluation; the department of technology dissemination; the department of management and technology services; and technical coordination department.

Furthermore, DIAN consists of the National (IAN) Agronomic Institute; the Regional Center for Agricultural Research (CRIA); the Central Chaco Experiment Station; and six experimental farms located in various regions of the country. Central Chaco is the only unit of the DIA located in the western region of Paraguay; all other units, including the headquarters of the DIA, are located in the eastern region (RICyT, 2008). IAN and CRIA have the technical staff and adequate infrastructure to conduct research in the long term. The experimental station and six farms are much smaller and are mainly used to test different varieties and for replication of research projects in different locations. (RICyT 2008).

Research activities are organized into 15 programs of which 11 focus on crops. The other four programs focus their activities on pasture and forage, soil, agro-meteorology and biotechnology. Livestock, veterinary and fisheries research is officially responsibility of the DIPA headquartered in San Lorenzo. In the past, the DIPA conducted research on meat, dairy, beekeeping, fishing, sheep and goats, animal nutrition, meat products and veterinary diagnosis (RICyT 2008).

3.1. Human Resources

FTE total public agricultural researchers in Paraguay decreased sharply, from 181 FTEs in 1991 to 128 in 2006. This drop can be explained by the rapid decline of all researchers in the DIA, the DIPA and CETAPAR in recent years.

Unlike government and not-for-profit institutions, the total capacity of agri-

cultural R & D in the field of higher education in Paraguay remained relatively stable during the 1991-2005 period with an average of 46 scientists etc. But, for the period 2005 -07, the total capacity of the FCA more than doubled (from 16 to 36 ETC) caused a rapid increase in the total capacity of agricultural R & D in the higher education sector in the country.

The doubling of the research staff of the faculty is largely due to the restructuring of the FCA mentioned above, the creation of a research direction and financing with IDB funds. Many new researchers work in the FCA since 2006, many of them young. Total agricultural researchers with doctor's degree in Paraguay is very low compared to other South American countries such as Argentina (17 percent), Chile (26 percent) and Uruguay (24 percent; Stads, y Allegri Cotto 2008; Stads y Covarrubias-Zuñiga 2008; Stads, Ruiz y De Greef 2008). The fact that the country's universities do not offer doctor degree may partly explain the relatively low percentage of agricultural research staff with doctor's degree in Paraguay. In contrast, most other Latin American countries began their doctoral programs related to agriculture in the 1970s.

In 2006, 41 percent of DIA researchers had master's degree, which represents an improvement over the corresponding ratio recorded in the previous decade (27 percent). Only two of the 64 scientists of the day were holding a doctorate. The IAD does not have formal training programs for their staff. As the DIA is a department linked to the MAG, not an institute of independent science and technology, researchers working at DIA are considered public officials and, therefore, receive the same treatment as other MAG officers not working in agencies investigation. In 2006, 32 percent of total FTEs of Paraguay included in a sample of four agencies were women;

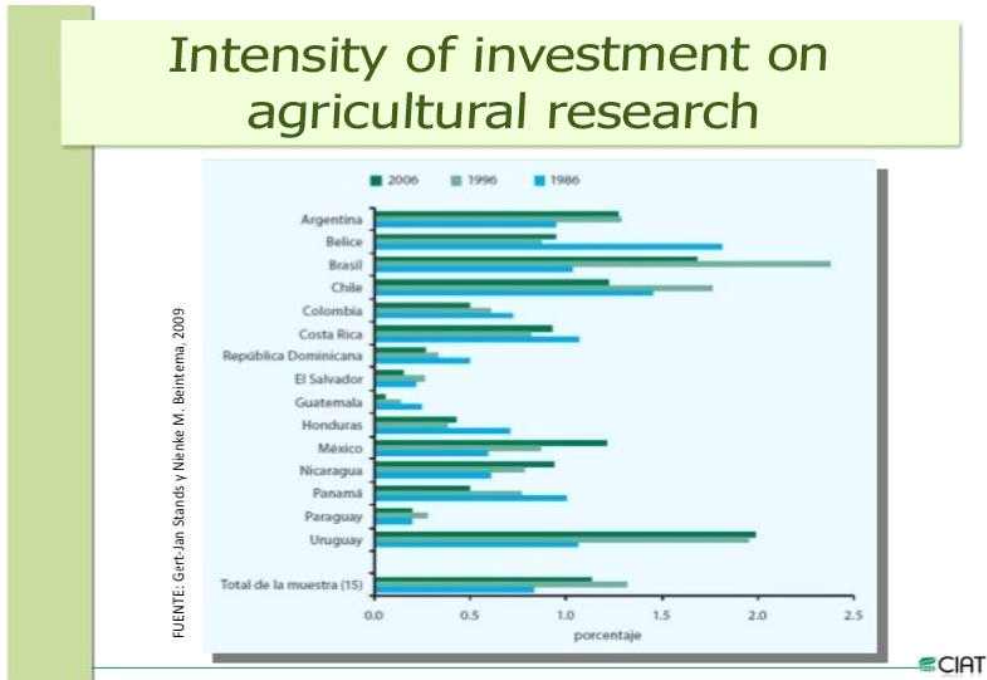
6 percent were holding a doctor's, 29 percent a master's and 38 percent a bachelor's degrees. In Paraguay, the percentage of researchers in the total agricultural research staff is similar to the percentage for other countries in the region such as Colombia (32 percent) and Chile (30 percent); (Stads y Covarrubias Zúñiga 2008; Stads y Romano 2008). It should be noted that the two DIPA researchers were women. The DIA, the only agency for which has historical data, recorded a substantial increase in the percentage of women in total research staff from 14 percent in 1986 to 29 percent in 1998 and 34 percent in 2006, despite the overall decrease of research staff in the last decade.

3.2. Resources destined to the farming research

In 2006, Paraguay invested USD 0.20 on agricultural research for every USD 100 of GNP Ag, an amount slightly lower than the corresponding ratio in 1996. By way of comparison, in 2006 the intensity ratios of other MERCOSUR countries and Chile (\$ 1.22), Argentina (USD 1.27), Brazil (USD 1.68) and Uruguay (USD 1.99) were much higher (and Beintema Avila 2008; Stads y Cotto 2008; Stads y Covarrubias Zúñiga 2008; Stads, Ruiz y De Greef 2008).

In 2000, the ratio of Paraguay was also lower than the official average of 2000 for Latin America and the Caribbean (USD 1.14), developing countries (USD 0.55) and the global average (USD 0.98 Beintema y Stads 2008). Paraguay relies heavily on new technologies from Brazil; Brazilian farmers with resources have large areas of land in Paraguay, near the border with Brazil, as the price per hectare is three times lower on the Paraguayan side

of the border. Brazilian farmers bring many new technologies to Paraguay, especially for soybeans, sugar cane and livestock.



On the negative side, the fact that such technologies generated in Brazil moves to Paraguay has created a widespread perception that Paraguay will achieve that access to new technologies without investing in them. Agricultural research in Paraguay is largely funded by the national government and internal resources.

Wage costs of the DIA and DIPA were directly funded by government appropriations. However, the Paraguayan government does not devote a specific budget to the actual costs of the investigation. These are largely funded by internally generated revenue, selling seeds / livestock and services, and the results of tests on demand for the private sector.

3.2.1. Guideline of the Research

In 2006, 72 percent of 120 FTEs from a five-agency sample conducted crop research activities. The livestock research accounted for 12 percent of the total, research on natural resources 7 percent and forestry research 4 percent. Research on soybean cultivation, Paraguay's most important export, accounting for 17 percent of all crop research conducted in the country. Research on cotton accounted for 16 percent, about 13 percent vegetables, fruit about 12 percent, on sugar cane and maize 9 percent each, and about 8 percent for wheat.

Research on soybean and cotton dominate the research program of the DIA while CETAPAR focuses almost exclusively on vegetable crops.

Research on sesame prevailed at UNA. In 2006, 26 percent of the crop researchers of the university are involved in sesame research. Most researchers focused on livestock Paraguay, research activities in cattle (23 percent), dairy products (16 percent) and poultry (6 percent ;). UNA does most of the country's livestock research (8 of 12 ETC).

3.2.2. Role of the IPTA in the plain of fight against poverty

One of the shortcomings of the MAG system is the difficulty to coordinate research activities with the. IPTA generates technology and enforce state policies, in this case, the objective is to combat poverty, for which we have specific products that we will launch and transfer to small farmers so they can adapt to implement farming with technology. (Dr. Daniel

Idoyaga.2013.).

The bottleneck in development is that the Paraguayan peasant is a little reluctant to adopt technology. The Paraguayan peasant is a very traditional person and IPTA will like another strong arm to materialize at field level generation technology generated in the experimental fields in a harmonious coordination with the Department of Agricultural Extension (DEAg). .(Dr. Daniel Idoyaga.2013.).

IPTA works in all areas with priority to family farming, such as cotton, sesame, ka'a he'e, cassava, vegetables, and field crops such as soybeans, wheat and maize, among others. . (Dr. Daniel Idoyaga.2013.). Successful technology adoption at level of the small farmer must complete the triangle that make up the research, extension and credit assistance.

3.2.3. Outlined Achievements of the experience regarding dissemination OUTLINED

In the investigations, we can highlight the achievements of technology transfer processes to family farming, the following: The view that technology dissemination system must be built from the local level, bringing it to farmers and seeking their participation in research work and in social control, involving other local and regional rural development actors for the assistance to be as comprehensive as possible.

The need to organize a system of support to entities and local processes in various fields. At the time, the rural-Colonies Consolidation Project IDB had recommended the formation of COMPREHENSIVE SERVICE CENTER for community support; nowadays there are the experimental cen-

ters, the Centers for Agricultural Development and the Interinstitutional Coordination Board (Mecid-DAR). The importance of focusing public resources on providing a free service to small farmers, but taking care not simple handouts. There is a greater consensus of small farmers, in their need for assistance in various aspects related to human development, not only in technology production. The existence of numerous private entities and civil society carrying out extension work or technical assistance has interesting experiences and methodological tools.

Chapter 7

SWOT Analysis of the Research and Technology Dissemination to the Family Farming

SWOT analysis is one of the most common methods of strategic analysis to evaluate the potential of a company / institution and its market / customer. The main purpose of this analysis is to provide a comprehensive overview of the management; what is happening in the environment of the organization if the company has the resources to react to the opportunities and challenges offered by the environment. The result of this analysis should be a set of strategies that must implement the organization to achieve its objectives.

Tabel 6-1. SWOT of the Family Farming in Research

STRENGTHS <ul style="list-style-type: none">• Availability of land.• Availability of natural resources.• Family labor available.• There basics of production in certain areas.• There is a basic producer organization.• Solidarity between producers.• Availability of technical research	WEAKNESSES <ul style="list-style-type: none">• Limited financial resources for research and technology dissemination for family farming• Decreasing price of income crops.• Food Security Crisis• Degradation of natural resources.• Inability to participate in export
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<p>and TECHNOLOGY DISSEMINATION</p>	<p>markets. Lack of complementary services and research and TECHNOLOGY DISSEMINATION</p> <ul style="list-style-type: none"> • Distrust public assistance programs. • Land tenure. • Access Unit timely credit remittance transfers and public wages. • Poor business management capacity. Barriers to access to capital, financing and technology. • Insufficient income for self-accumulation and high dependence on public support. • No chains have joined profitable. • Isolation modern sector actors
<p>OPPORTUNITIES</p> <ul style="list-style-type: none"> • It has formed technological packages for family farming. • Non-governmental organizations, cooperatives and universities with agricultural research programs. • Biotechnology new technologies, automation. • Biofuels • Participation in contracts with supermarkets • Participation in Public procurement- BREAKFAST-SCHOOL LUNCH and others. • Participation in contracts with agribusiness. • Rural development projects promoted by national, departmental and municipal government. 	<p>THREATS</p> <ul style="list-style-type: none"> • Research and concentrated in private or Transnational Corporations innovations. • Concentration of production and marketing. • Global warming • Degradation of natural resources and environment. • Availability of funds for the follow-through of technological packages of family farming.

■ PRIORITIES TO IMPROVE THE RESEARCH AND TECHNOLOGY DISSEMINATION IN THE FAMILY FARMING

New interventions in which the research and technology dissemination for family farming are included, according to Escobal (FAO and IDB 2007) should incorporate with more emphasis the following four dimensions:

- a) Sense of integration of multiple instruments and actions, designed according to the specificities of territories and types of family farming.
- b) Concern and projection to address market failures and remove barriers for a more efficient and direct inclusion.
- c) Demand-driven strategies, which include mechanisms for participation to listen to those who could not express.
- d) Implementation of interventions based on small-scale validation, prior to its expansion.

■ PRIORITIES REGARDING RESEARCH IN THE FAMILY FARMING

Based on the study of PROCISUR-BID (1999), priority issues to be investigated were defined, where the following appear at the top:

- The price of fertilizer and energy,
- Unfair competition with subsidized imported products,
- Market imperfections,
- The lack of credit and high interest rates or low productivity of labor.

■ DEMANDS AND ITS RESTRICTIONS

Successful modern experiences in a context of competitive agriculture in the global market, indicate that changes in productivity and reduction in production costs, together with the quality of the products and sustainability of production processes are the most powerful mechanisms of competition, and they are associated to knowledge and technological innovation.

According to Publication - institutional and technological innovations for production systems based on family farming - IICA. 2009) have identified the following points of interest regarding the demand of the family farming, which could be adapted to the situation of our country:

The elements that limit the technological changes of family farming are basically structural and hardly removable with specific and isolated measures. It means the restricted access to land and water, a lack of infrastructure and capital market imperfections and low bargaining power, to advanced average age of the head of the holding and its correlate, and a low level of formal education. In general, these factors are presented together and reinforced each other. Even when technology is incorporated into family farms, many times these restrictions prevent potential is expressed.

Investment in research and technology dissemination for the poorest farmers in low productive potential is not justified by criteria of private investment and tends to be based on arguments of fairness. This leads to certain voluntarism and generates risk that the investment does not perform as expected and, therefore, not conducive to the intended beneficiaries.

The research with greater emphasis on experimentation and adaptation of practices inexpensive and less risky (local seed selection, sowing, plant density, better use of organic matter) has been accepted by small farmers.

The theme of weak economic and financial management of the family farming , as well as the difficulties of integration to more profitable markets, have not been sufficiently addressed by the R & D. Is more frequent that farmers ask to agricultural extensionist: what should produce and how to diversify production? How to produce?

To define research priorities in technological innovation, there are privileged mechanisms of demand, but this is mediated by representatives disconnected of the farmers

Farmer organizations of family farming have focused their petitions in issues different from technology, and in this sense are not the suitable links for an effective demand.

There are not enough elements to define the main demands of the family farming or to determine if the mentioned demands differ from those posed by agricultural entrepreneurs. The technical demands are very generic, which means previously investigate the critical points of crop or livestock category. The study of productivity gaps of the same crops for different types of farmers seems to allow explaining more clearly the real demands of innovation.

■ TECHNOLOGY OFFER

Research on the technological offer certain crucial elements have been identified as: Technological innovation is significantly linked to capital and inputs, so it is a very restrictive framework of innovation.

The offer that in the past depended on the state institutes, universities and suppliers of inputs, today depend more on technological antennas of agribusiness and market players, touring and direct observation to the most advanced agriculture. The diffusion of innovations among farmers is faster than in the past, often without any external actors. Family farming has not been really inserted into this dynamic.

Scarce human resources involved in technology dissemination are trained enough for its work and do not invest in overcoming this weakness.

The adequacy of supply to production systems and their relationship with the environment is very rational in theory, but in practice it is almost unfeasible in their attempts to mass by high costs and resources required.

It has been shown that the offers of technologies that are hinged to specific markets, such as providing agro-industries development programs of suppliers, have a high probability of adoption by family farming, because in addition to the security market are accompanied by credit and technical assistance.

To the extent that gradually the relative profitability of agriculture is an uncertain bet, it has increased the importance of the offer of technology management for economic production.

■ ASPECTS TO CONSIDER TO IMPROVE THE TECHNOLOGY DISSEMINATION TO family farming SYSTEMS

The results of the analysis of national and international experience in technology dissemination are summarized below considerations that must be evaluated to improve service attendance of IPTA and MAG DEAG for family farming:

The technology must have variants in various agri-environmental conditions and simple homogeneous diffusion of "technological packages" is inadequate: In each case, a generation and / or adaptation process is required and adjustment of technologies to the environment conditions - or partic-

ipatory research.

The importance of a strong involvement of farmers: Advantage that farmers are actively involved in the research process through participatory methods has been recognized by various studies. In defining research problems and in the selection of the possible solutions is given significant weight to the opinions and priorities of small farmers, so that investigations seek to solve the most sensitive problems for them. The experiments are carried out by the farmers themselves, in their specific production requirements, so that the results obtained to their agro ecosystems are adapted to their socio-economic characteristics and their production systems.

Decentralization of technical assistance, the conformation of REGIONAL UNITS OF TECHNOLOGY DISSEMINATION, linked with Research Centers - DEAG Regional Offices, together with municipal or neighborhood committees, and framed within a municipal plan or departmental plan, seeking to bring assistance that is more comprehensive for the process of development of agriculture. Add wills and institutional coordination, will help the impact of assistance.

The success of innovation processes depends not only on technological aspects: Without the adoption of the technology and its incorporation into the productive circuit, the technological innovation cycle is not completed. No guarantee that innovation is maintained over time, or that transcends to other farmers and actors in the production chain. To do other components, the main of which are chains of corporate production products and technology services obtained are required; organizational development and empowerment of farmers.

Innovation processes require time to mature: Must meet times of growth of plants and animals and their productive cycles, rural innovation processes take time to mature and consolidate, so insufficient lead time projects and requiring accompaniment are not suitable

Establishment of learning centers and networks and knowledge: To achieve higher incomes and improve the quality of life, the farmer requires complementary knowledge, which should ensure the means for him and his family to acquire more knowledge. Knowledge must also be improved and strengthened to trainer agents of rural farmers. Importantly, many farmers currently do not have basic knowledge of agricultural production, and their practices are the result of transfers from farmer to farmer.

In recent years it has stressed the need to take into account the heterogeneity of family farming and their typologies, both in determining the development strategies of the social conglomerate, and the definition of specific policies and intervention instruments

The transfer of assets and capabilities includes both programs related to access to land and water, such as technology dissemination and training for better performance in the labor market, according to the specificities of each type by country and region

Chapter 8

Conclusion and Recommendations

The aim of this work is to seek an improvement in the TECHNOLOGY DISSEMINATION process, in fulfilling the mission of the IPTA, where MAG - DEAG is an important ally, so that assistance to family farming requires a policy that strongly encourages technological innovation processes in their production systems in the different territories in which their agricultural activity, and the organization of a system that supports its strengthening and expansion takes place

This policy should focus its work and resources on small producers by the foundations of the programs to combat poverty. Implemented by the national government, for which it must adequately consider the characteristics of their agricultural technology applied and the conditions of agroecology where it develops.

The system should transfer technology to family farming, must be built from the bottom up, from the local level, taking into account the specific features and the processes in each location.

Should be responsible for promoting, supporting and co-finance innovation processes of small producers who have the potential to continue in the medium and long term, that can scale locally and conceited participation and interaction of different actors

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Part II

The Results of the Joint Research
by Korean Research Team

제 1 장

개 요

1. 조사목적

이 공동조사의 목적은 파라과이 소규모 농가의 농업기술 보급 시스템의 발전을 위해 한국의 농촌 경제 발전 경험을 공유하고자 함이었다. 이를 위해 파라과이 일반 현황, 농업 현황, 농가 현황, 농업기술개발 보급 체계, 주요 관련 정책을 분석하였다. 그리고 한국의 농업과 농업정책, 농업인력, 농업기술개발 및 보급 체계, 농업교육 등의 현황과 시사점을 도출하였다.

2. 조사방법

공동조사는 한국과 파라과이 양국의 조사단의 협동연구로 이루어졌으며, 역할분담을 통해 수행되었다. 한국의 연구진은 한국농촌경제연구원의 마상

진 박사와 공주대학교의 박덕병 교수였다. 파라과이 연구진으로는 IPTA에 Juan Carlos Cousiño, Victoriano Barboza, Myrtha Zarza, Fulgencio Candado, Celeste López, Pedro J.Caballero, Fernando Espinoza, Jorge Bareiro, Miguel Florentin, Alodia Gonzalez, Patricia Pereira 등과 파라과이 농림부의 Oscar López, Juana Caballero, Carlos Melgarejo, Delia Ferreira, Víctor Sagalés, Lider Medina, Daniel Ortiz, Daniel Ortiz, Anahi Enciso 등이었다<표 1-1>

한국의 연구진은 농업의 기술개발 및 보급 체계와 관련된 한국의 경험 분석 및 제언과 ODA 추진을 위한 제안을 위주로 연구하였으며, 관련 전문가 및 지역의 농촌지도요원과의 면담을 통하여 파라과이 농업기술보급 체계의 실태와 문제점 분석을 수행하였다. 파라과이 연구진은 파라과이의 농업과 농가현황, 농업기술보급체계와 관련 정책 등에 대한 분석을 주로 하였다.

표 1-1. 공동조사 연구진 구성

	이름	기관	직급
1	마상진	한국농촌경제연구원	Fellow
2	박덕병	공주대학교	Professor
3	Juan Carlos Cousiño	IPTA	Director Research Center
4	Victoriano Barboza	IPTA	Director Research Center
5	Myrtha Zarza	IPTA	Director Research Center
6	Fulgencio Candado	IPTA	Chief Research Unit
7	Celeste López	IPTA	Chief Planning Directorate
8	Pedro J.Caballero	IPTA	Technical Officer-National Directorate
9	Fernando Espinoza	IPTA	Chief Research Unit
10	Jorge Bareiro	IPTA	Technology Transfer Officer-IPTA Caacupé

13	Patricia Pereira	IPTA	Executive Director IPTA
14	Oscar López	Extension Directorate- MAG(농림부)	Executive Coordinator
15	Juana Caballero	Extension Directorate- MAG(농림부)	Chief- Training Department
16	Carlos Melgarejo	Extension Directorate- MAG(농림부)	Manager- Agrarian Development Center-Misiones
17	Delia Ferreira	Extension Directorate- MAG(농림부)	Manager- Agrarian Development Center- Guairá
18	Víctor Sagalés	Extension Directorate- MAG(농림부)	Chief- Horticulture Department- Headquarter
19	Lider Medina	Extension Directorate- MAG(농림부)	Manager. Rural Development Center- Cordillera
20	Daniel Ortiz	Extension Directorate- MAG(농림부)	Coordinator. Programs, Projects and International Relationship
21	Daniel Ortiz	Extension Directorate-MAG (농림부)	Chief. Department of Territorial Management
22	Anahi Enciso	General Planning Directorate-MAG (농림부)	Manager- Agrarian Development Center- Guairá

3. 공동조사 일정

파라과이 공동조사 일정은 표 1-2과 같다. 파라과이 현지 조사 및 자문은 8월 5일부터 12일까지 이뤄졌다. 공동조사 일정은 다음과 같다.

표 1-2. 공동조사 일정

날짜/시간	세부 일정
8월 5일(수)	입교식 및 오리엔테이션 / 강의
08:30-12:00	환영사 및 KAPEX Academy 소개 [강의1] 농업전략 계획(농목축부) [강의2] 농업 농촌 개발전략 통합 시스템(SIGEST)
12:00-13:30	환영 오찬
14:00-15:30	액션플랜 작성 요령 설명 및 분임 토의
8월 6일(목)	강의 및 토의
09:00-10:30	[강의3] 대학에서의 농업기술 보급(UNA)
10:30-12:00	[강의4] 민간기업에서의 농업기술 보급(FECOPROD)
12:00-13:30	점심 시간
13:30-15:30	[강의5] 한국의 농업기술 보급(박덕병 교수)
15:30-17:00	[강의6] 소규모 농가 기술 보급 방법론
17:00-18:00	액션 플랜 토의
8월 7일(금)	현장 견학
09:00~12:00	IPTA 센터 이동
12:00-13:00	점심 식사
13:00-16:00	IPTA 센터 프로젝트 소개 및 부지 견학
8월 10일(월)	현장견학 및 토론
07:30~12:00	이동 및 북부 지역 시장 견학 (Abasto Norte)
12:00-13:30	점심 식사
14:00-16:00	파라과이 기술보급 시스템에 대한 토론
16:00~17:30	액션플랜 토론

날짜/시간	세부 일정
8월 11일(화)	강의 및 토론
09:00~11:00	[강의7] 식량 생산의 환경 변화와 파라과이의 농업 (박종대 소장)
11:00~13:00	[강의 8] 한국의 영농후계자 양성 및 발전방안
13:00~14:00	(마상진 박사)
14:00~16:00	점심 식사
16:00~18:00	[강의 9] KOICA와 농업 협력 방안(조한덕 소장) 액션플랜 토론
8월 12일(수)	수료식 및 액션플랜 발표/ 정책워크숍
09:00~09:30	액션 플랜 발표 준비
09:30~10:30	액션 플랜 발표(총 세그룹)
10:30~11:00	액션플랜 피드백 및 코멘트
11:00~11:30	KAPEX Academy 연수과정 평가
11:00~12:00	폐회식
12:00~13:00	환송만찬
13:30~15:30	KAPEX 정책 워크숍

제2 장

공동조사 내용

1. 파라과이 농업 현황

농업이 국가 전체 GDP에서 차지하는 비중은 약 23%(2013년 기준)이며, 농업부문 고용 비중은 23.79%(2011년 기준)에 달하는 등 파라과이 경제에서 농업분야가 차지하는 비중은 높다. 파라과이는 농촌인구와 농업인구 비중(2013년 기준)이 높은 농업 국가이며, 노동 가능인구 3,620천명 중 농업인구 비중은 23.79%인 86만명이며, 농촌인구 비중은 총 인구의 37%에 달한다(FAO 2014). 국토면적 대비 농업면적의 비중은 약 53%인데, 농업면적 중 경작면적은 3,900만ha로 농업면적의 18.6%를 차지한다.

그리고 28만 농가가구 중 18만호(65%)가 10ha 미만의 토지를 보유하고 있으며, 이 중 55%는 5ha 미만의 토지를 소유하고 있어, 이들이 소유한 토지는 국가전체 토지의 5%에 불과할 정도로 토지소유의 불균등이 심각한 실정이다. 그리고 10-15만 농가가 토지를 전혀 보유하지 못하고 있는 농가이다 (Hector, 2015).

2012년도 파라과이의 농업생산량을 살펴보면 대두, 사탕수수, 옥수수, 카사바, 밀과 소고기 등의 생산량이 가장 많다. 특히, 대두의 경우 파라과이는

세계 6위의 생산국이며 2012년 8.3백만 톤을 생산하여 약 5백만 톤 이상을 수출하고 있다. 하지만 파라과이 대두산업은 브라질 자본과 기술이 유입됨으로 인해 소농구조의 생산방식에서 대규모 영농으로 전화되어 파라과이의 전통적 방식이 자취를 감추고 있는 실정이다. 축산부문에서는 소고기가 가장 많이 생산되고 있다. 수출 순위를 살펴보면, 대두에 이어 소고기가 수출에서 많은 비중을 차지하고 있다. 파라과이는 세계 8위 소고기 수출국(2011년 기준)이나, 2011년과 2012년에 발생한 구제역으로 인해 수출이 감소하였다. 하지만 파라과이는 최근 백신을 사용하는 구제역 청정국 지위를 회복하여 수출이 다시 증가하는 추세로 전환되었다.

파라과이는 12개의 대규모 도축장을 보유하고 있으며, 이 중 11개소에서 소고기 수출을 위한 도축 및 안전관리를 관장하고 있다. 하지만 대부분의 도축장은 브라질 자본과 기술이 접목되어 운영되고 있다. 특히, 파라과이 소고기 수출은 칠레, 러시아, 유럽연합국가(EU)에 집중되고 있으며, EU 수출의 경우 복잡한 검역조건을 충족하기 위한 시스템이 구비되어 있다.

표 2-1. 파라과이 주요 농산물

순위	품목	생산량(단위: 천톤)
1	대두	8,350
2	사탕수수	5,450
3	옥수수	3,079
4	카사바	2,560
5	밀	1,400
6	우유	515
7	쌀	380
8	소고기	354
9	오렌지	245
10	돼지고기	167

2. 파라과이의 주요 정책과 해외 원조

□ 파라과이 국가개발전략

파라과이 공공정책은 3개의 층위로 구성되어 있다. 첫째, 국가개발전략(National Development Plan, 2014-2030)으로 빈곤감소와 사회개발에 초점이 있다. 둘째, 부문전략(Sectoral Strategic Framework)으로 가족농과 식량안보에 초점이 있다. 셋째, 제도적 전략기획(Institutional Strategic Plan, 2014-2018)으로 가족농 육성에 초점이 있다.

첫 번째로 파라과이 국가개발전략은 모든 국민을 대상으로 사회기초서비스 접근성과 삶의 질 개선과 소외계층을 중심으로 불평등 완화를 강조하는 비전을 수립하여 사회개발을 위한 공공정책(Propuesta de Política Pública para el Desarrollo Social, Paraguay para Todos y Todas 2010-2020, PPDS 2010-2020)과 경제·사회전략(Plan Estratégico Económico y Social 2008-2013, PEES 2008-2013) 등의 상위전략과 분야별 전략으로 구성되어 있다. 2014-2030 국가개발전략의 3가지 전략은 첫째, 빈곤감소와 사회개발, 둘째, 통합적인 경제성장, 셋째, 세계 속의 파라과이이다.

그리고 두 번째로 부문전략으로 농업전략(Agricultural Strategic Framework, 2014-2018)을 살펴보면 다음과 같다. 농업전략의 목적은 농촌주민의 삶의 질을 수준을 개선하는데 있다. 이를 위해서 생산성향상, 사회통합, 지속가능한 환경과 지역통합에 초점을 두고 있다. 농업·농촌개발 및 식량안보 분야의 주요 전략으로 빈곤감소 전략(Estrategia Nacional de Lucha Contra la Pobreza)과 농가의 식량주권, 원주민경제, 영양개선, 식량안보를 위한 국가계획(Plan Nacional de Soberanía Alimentaria 2009-2013) 등이 있다.

세 번째로, 제도적인 전략으로 “Agricultural Strategic Framework, Basic

Guidelines 2014/2018(Marco Estrategico Agrario Directrices Basicas 2014/2018)”을 수립하였으며, 1) 농업 경쟁력 강화, 2) 가족농 발전과 식량 안보의 개선, 3) 제도적 및 행정적 개선과 강화, 4) 산림, 토양, 수자원의 지속가능한 이용과 관리를 주요과제로 선정하였다(MAG/SIGEST 2013).

그림 2-1. 파라과이 국가개발전략



자료 출처: 관계부처합동 (2013).

□ 농업개발전략

파라과이 농축업 분야의 발전을 위한 각종 프로그램과 사업형성 을 위한 정책 구상과 시행을 위한 농업전략도구로서 농업개발전략은 여섯가지를 핵심과제로 한다.

- 1) 농업경쟁력 제고
- 2) 가족농과 식량안보 발전
- 3) 지속적 삼림 개발과 환경서비스 제공

- 4) 목축 및 농장 발전
- 5) 기후변화 및 다양성과 관련된 위험 관리
- 6) 사회통합, 농촌지역 고용

6가지 핵심 과제 중 본 조사와 밀접한 관련이 있는 농업 경쟁력 강화 전략과 축산업 개발 전략 부문을 살펴보면, 파라과이는 국가경쟁력포럼(ICF)에서 133개 회원국 중 124위를 차지하는 등 국가경쟁력이 매우 낮은 실정인데 그 요인으로 정부정책의 일관성 부족, 조직별 국가 개발 비전의 공유 미흡, 유관기관의 통합 관리 미흡 등으로 인한 국가 조직의 비효율적 운영을 들 수 있다. 따라서 파라과이 정부는 농업부문에서 경쟁력을 갖추기 위해 국내외 기술개발 유관기관과의 협력관계를 강화하여 효과적인 기술보급체계를 구축하고자 한다. 또한 농업정보시스템 구축을 통한 통합 정보관리 강화, 기존 기술체계의 현대화 구축, 농산물 공급망 위주의 클러스터(cluster) 구축, 인프라 및 시장관리에 대한 ICT 활용을 적극 추진하고자 한다.

□ 농업분야 해외 원조

파라과이 농업이 대농중심으로 운영되고 소농들이 빈민층화 됨에 따라 농업부분에 지원하는 타 공여기관의 주요 정책은 소농의 소득증진을 위한 농작물의 생산성 향상에 중점을 둔 지원이 이루어지고 있다. 생산성 증대를 위해서는 ①관배수시설 확충 및 개선, ②품종 개량 및 보급, 재배기술 전수 등 농업기술의 전수 그리고 ③농업기술 연구역량 강화를 목표로 지원이 이루어지고 있다. JICA 및 GIZ 등은 농업 생산의 기반이 되는 토양 척박화를 개선하여 지속가능한 농업환경을 조성하기 위한 지원을 하고 있는 상태이다. 이렇게 다양한 국가에서 농업부분 지원이 이루어지고 있지만 공여국간의 공식적인 정책협의체가 없어, 일본(JICA), 대만, 유엔식량농업기구(FAO), 독일(GIZ) 등이 상호 정보교환을 협력하는 체계 구축이 필요한 상황이다.

표 2-1. 주요 공여기관의 관련분야 주요사업

주요 공여기관	사업내용
JICA	농업 토지개발 정책 자문
	지방도로 개선사업(Caazapa와 Itapua주)
FAO	우수 농업기술 확산사업(영양 개선 및 식량 안보를 위한 농산물 생산 및 상업성 향상 사업)
FAO	지속가능한 수산양식을 위한 국가개발계획 및 전략 수립
	농촌개발 및 영양안보에서의 여성 참여 확대를 위한 정책수립 자문
	농업개혁 및 농촌개발을 위한 실행계획 수립 및 회담 지원
	남미에서의 수산양식 및 어업기술 확산 및 강화
대만	농산물의 상업성 향상 사업
	양식사업 개선 및 상업성 향상을 위한 센터 건립사업
대만	원예농업 생산성 및 상업성 향상
	축산업(돼지) 기술지원
GIZ	자연자원의 지속가능한 관리를 위한 소농에 대한 지속가능한 농업 기술지원 및 산림관리기술 지원
IDB	농업, 산림 분야 재원조달(대출) 개선을 위한 정책, 규정, 기술 등 자문
FOCEM	식품관리(통제), 생물안보(biosecurity)를 위한 실험실 건설 및 기자재 지원 사업

3. 파라과이의 주요 농업 기관

- ☐ 농업기술연구소(IPTA: The Paraguayan Institute of Agricultural Technology)

1990년대 초반에 이루어진 조직개편을 통해 농업연구국(IAD), 농업지도

국(DEAg: Full name)과 가축연구생산국(DIPA: Full name)가 만들어졌다. 그 뒤 2010년에는 법률에 의거, IAD와 DIPA가 통합되면서 IPTA가 설립되었다. 이에 따라 현재 파라과이에서 농업분야 기술의 연구개발 및 보급을 담당하는 핵심적인 두 기관은 IPTA와 DEAg이다.

IPTA는 농업과 축산업의 기술을 연구개발하고 자체 농장에서의 시범사업 등을 거쳐 농가에 이를 보급하는 역할을 담당하는 기관으로, “농업기술을 개발, 발굴, 변형, 활용, 전파, 이전하며, 농림축산 유전자원을 관리”하는 일을 목표로 한다. IPTA는 2012년 조직의 발전을 위한 전략계획, 즉 「제도 전략계획, 2012~2021」을 작성하였다. 그리고 이 계획서가 포함하는 10년을 전, 후반으로 나누어 그 전반기 계획인 「IPTA 중기계획, 2012~2016」을 작성, 발표하였다. 비전으로는 “지속 가능한 농업생산 연구와 기술혁신을 선도하는 기관으로서 국민의 복지향상에 기여한다”와, 기관의 목표로 “사회적 참여와 인적자원의 활용을 통해 농업관련 정보와 기술혁신, 안정적인 경쟁력을 갖춘 생산 과정과 생산 방식을 개발한다”고 언급하고 있다.

제도전략 10년에서는 다음과 같은 다섯 가지의 전략적 목표를 수립하였다. 이는 IPTA의 제도 강화, 인적 역량과 지식 관리의 발전, 혁신적이고 경쟁력 있으며 지속 가능한 환경친화적 농업부문 기술의 개발, 재원의 다양화, 개발된 기술의 확산과 전파를 위한 전략의 개발 등이다.

<IPTA의 주요 연구 분야>

- 토지와 기후: 토지의 유형, 광(光)주기, 온도, 관계시스템
- 비료: 비옥함, 유기성 비료, 미네랄비료, 천연비료
- 식물위생: 병충해 예방 및 저항
- 농학: 경작법, 농지 밀도, 기간, 파종 등
- 생산시스템: 농수산, 어업, 삼림의 종합적 시스템

<IPTA의 전략목표>

- 인적자원의 발굴과 지식 함양
- 농업분야에 있어 혁신적이고 경쟁력 있으며 지속가능한 기술을 개발하고 환경친화적 기술 보급
- 용자 및 대출기관을 다양화
- 기술 이전과 보급을 위한 전략을 발굴

□ 농업지도국(DEAg: The Directorate of Agriculture Extension)

DEAg는 삶의 질 향상, 농업 생산성 향상, 생산자에게 기술적 혜택 제공 등을 목적으로 설립된 정부조직으로 164개의 지역사무소와 본원을 통해 약 1,800명을 고용하고 있는 대규모 조직이다. DEAg는 과거 우리나라의 농촌 지도소와 유사한 성격의 업무를 수행하며, IPTA 및 IICA, 그리고 기타 국제 기구에서 개발된 농업기술을 훈련받아 생산자에게 전수하는 것이 주요 업무이다. 특히 DEAg는 여성농업인 역량강화, 관개수로 구축, 농업 인프라 건설, 지역개발, 토착민 영농 등에도 초점을 두고 있으며, 1) 국가와 농축산 산업 부문의 이익에 근거한 실행 정책 수립, 2) 교육 및 기술 지원과 관련한 목적과 목표 달성을 위한 농업 차관부의 가이드라인 수립, 3) 직무 매뉴얼 내 규정된 기준 적용과 준수, 4) 해당 요청이 있을 경우 기관을 대표하는 기능 수행, 5) 행정 협력과를 통해 기관을 구성하는 각 과의 과제 지정, 6) 공무원의 임명, 해임, 승진 및 이동 등 제안, 7) 연간 업무 계획의 이행 승인 및 추진, 8) 농업축산부가 수립한 농축산 분야의 프로젝트, 프로그램 및 계획과 관련하여 기관의 참여 활성화, 9) 농업축산부의 요청 시 기관 운영에 필요한 재정 자원 관리, 10) 국가 기관과 국제 기구와 관련한 기술 및 자원 협력 업무 수행 등의 업무를 수행하고 있다.

ICT 활용 현황은 기술자와 DEAg와의 인터넷 활용이 전부이며, 농가에게 전달하는 기술이나 기타 관련 정보는 ICT를 활용하여 공유되지 못하고 있

다. 기본적으로 농가에서 활용할 수 있는 ICT는 인터넷으로 판단되나, 파라과이 인터넷 보급 상황은 낮은 편이기 때문에 휴대전화를 이용한 정보 공유도 고려할 필요가 있을 것으로 판단된다.

<농업지도국 DEAg 역할>

- 미션: 국민의 삶의 질을 제고시키는 동시에, 지속가능한 농업발전을 이루는 정책 수립
- 비전: 농촌가구를 위한 양질의 농업서비스를 제공 할 수 있는 인력을 보유한 투명하고, 선구적 기관
- 목표: DEAg는 끊임없는 발전을 통해 농가에 종합적 기술을 지원하여, 이들이 생산과 직접적인 연관이 있는 유익한 기술과 자원을 채택하고, 생산자원과 환경의 지속적인 보전을 이룰 수 있는 기술 적용을 이룰 수 있도록 함

□ 대학농촌지도부 (DEU: Direccion de Extension Universitaria (Servicio a la comunidad))

대학 농촌지도부(DEU)는 개인, 민간기업, 공공기관과 아순시온 국립대학 농학부(FCA) 간의 농촌지도 관련 연구와 그 결과의 지속적인 협력교류를 위한 연계성을 증진시키고 학생들의 사회적 책임의식을 고취시키기 위해 설립되었다.

현 농촌지도 관련 법규에 따라 대학농촌 지도부(DEU)는 프로젝트 추진을 위한 공간 마련, 민관기업과 협정 체결, 학생들의 지역프로젝트 발표 등의 활동을 한다. 이를 통해 생산조직 설립, 방문객 및 교육기관을 대상으로 한 농촌현장지도, 농촌의 날 및 FCA민속축제 개최, 농업리더쉽센터 설립, 연대감 고취 캠페인 등의 성과를 거두고 있다.

4. 파라과이 농업기술보급체계

파라과이의 농업기술보급체계는 농업기술연구소(IPTA), 농업지도국(DEAg), 아순시온 대학의 대학농촌지도부(DEU)에서 이루어지고 있다. 우리나라와 같이 농업기술보급을 담당하는 정부기관은 DEAg이며 IPTA는 일부 기술보급사업이 있긴 하지만, 농업연구를 주로 담당하는 정부 기구이며, DEU는 학생들의 교류증진과 학생들의 사회적 책임의식을 고취하기 위하여 기술보급사업을 하고 있다. 파라과이 Agricultural Census에 따르면 농업인 중 80%가 아무런 기술적인 지원을 받지 못하고 있다고 하였다(Paraguayan Institute of Agricultural Technology, 2015).

파라과이의 농업기술개발 기관인 IPTA는 전국 11곳에 지역 연구센터와 실험농장을 가지고 있다. 연구업무에 종사하는 직원 수는 2013년 121명(박사 4명, 석사 25명, 학사 92명)이다. 연구지원 직원(실험실 및 현장 관리자 등)의 수는 150명, 행정직원(기사, 경비 등)은 76명이다. IPTA는 정부가 예산의 70% 가량을 지원하며 나머지는 자체수입을 통해 조달한다. 자체수입은 농축산업 관련 재화와 서비스 판매, 종자 로열티 판매, SENAVE와 국립 임업연구소(INFONA) 등 정부기관으로의 기술이전 등으로 확보하고 있다. 지출은 인건비가 70% 이상을 차지하며(2013년은 84%), 나머지는 사업운영비와 자산비용 등으로 구성된다.

파라과이의 농촌진흥기관인 DEAg은 농가에 대한 기술지원을 위한 역할을 담당하기 위하여 전국적으로 15개의 주에 20개의 농업개발센터(CDA)와 184개의 지역농업기술지원소(ALAT)를 가지고 있으며, 이들 조직을 통해 농가에 대한 기술지원을 하고 있다. 현재 약 600명의 기술자와 200명의 행정직원들이 약 3만의 농가에 대해 지도업무를 수행하고 있다. 대부분의 기술진은 고졸의 학력을 갖고 있고 기술자당 약 80농가를 담당한다. DEAg의 기술보급 서비스는 개인에 대한 1대1 지도방식, 집단 지도방식, 지역단위

지도방식으로 이루어진다. DEAg가 대상으로 하는 수혜자 집단은 생계위주의 농업을 영위하는 가족농으로서, 자신의 농장에 거주하면서 생산과 경영 활동으로 수입을 확보하는 가족이어야 하며, 소유 농경지가 동부지역(Eastern Region)은 50ha, 옥시덴털 지역(Occidental Region)은 500ha를 초과하지 않아야 한다.

파라과이 농업기술 연구개발 및 보급체계의 문제점은 다음과 같다. 첫째, 2010년에 기존의 농업연구국(IAD)과 가축연구생산국(DIPA)이 통합하여 출범한 신생조직으로서 IPTA는 10개년 전략계획과 5개년 중기계획을 통해 파라과이의 농업연구를 위한 예산이 적고, 혁신적 기술개발을 만들어내기에는 역량이 부족하며, 기술자들이 급여가 낮아 두뇌유출이 많다는 점들을 문제점으로 지적하였다. 또한, 기술보급 과정에서는 보급체계와 장비 등 지도자원이 부족하다는 문제, 기술보급의 대상인 농민의 수용태세가 소극적이며 기술보급 요원을 불신하는 문제, 그리고 가이드라인이 수시로 변경되는 등 기술보급을 둘러싼 여건이 좋지 않다는 문제들을 안고 있다.

둘째, IPTA의 경우 농업기술개발을 위한 예산은 전체 예산의 4분의 3 정도만 정부가 지원하기 때문에 예산확보의 안정성이 보장되지 않고 중장기 기본연구에 충실하기 어려운 상황이다. 농업분야의 연구개발은 농축산물의 계절성 및 장기적 사육 등으로 단기간에 그 성과가 나타나기 어렵기 때문에, 중장기적인 안목으로 안정적으로 재원을 확보하여 기술개발을 꾸준히 시행하는 것이 꼭 필요하다. 자체수입을 통해 연구개발 비용의 일부를 충당하여야 하는 경우 소농이나 소비자, 국가의 농업정책 담당자 등의 요구보다는 수요자의 요청에 따른 연구 및 기술개발, 기 개발된 성과물의 판매 등 단기적 수익활동에 치우치지 않을 수 없게 된다. 그러므로 소농을 위한 연구개발과 개발성과의 보급에 충실하도록 충분한 정부예산의 지원이 있어야 할 것이다.

셋째, 연구개발과 성과 보급의 연계성 확보를 위한 채널이 부족하다. 이에 따르면 농업기술의 생성에서 도(department) 단위에서의 기술전수까지는 IPTA가 담당하고, 소농 등 농촌지역 농가를 대상으로 한 훈련, 보급 등 서

비스는 DEAg가 담당하는 것으로 볼 수 있다. 실험실에서 개발된 새로운 기술이 시범포를 통하여 농가까지 전달되기 위해서는 양 기관의 밀접한 교류와 연계가 필수적임을 알 수 있다. 한국과 달리 연구와 기술보급 기관이 한 기관에서 이루어지지 않고, 분리되어 있어 연구와 기술보급 기능간의 연계는 잘 이루어지고 있지 않다. IPTA 본부와 11개의 지역 센터와 농장이 DEAg 산하의 전국 20개의 농업개발센터(CDA)와 184개의 지역농업기술지원소(ALAT)와 효율적으로 역할을 분담하고 기관간 밀접하게 소통함으로써 효율적인 연계성을 확보할 수 있어야 한다.

5. 한국의 사례

우리나라의 근대적 농촌지도사업은 1950~60년대 도입 당시부터 미국의 영향을 많이 받아 농촌지도사업을 지도대상자의 행동(지식과 기술, 태도 등)을 바람직한 방향으로 변화하게 하는 농촌사회교육으로 인식하여 왔다. 이러한 교육적 특성은 농촌지도사업을 성공적으로 실시하기 위해서 조직체계나 지도인력, 지도방법 등에서 교육효과가 최대로 나타날 수 있는 체계를 갖추도록 여건을 조성하여 왔다. 이와 관련하여 농촌지도 업무를 담당한 지도직공무원들은 사업 초창기에서부터 행정업무나 정치적 활동에 관여하지 못하도록 하고 법이 정한 관련 업무에만 전념토록 하였으며, 행정조직과 분리하여 별도의 독립된 조직에서 사업을 추진하도록 하였으며, 농업연구와 기술보급이 동시에 연계될 수 있도록 농업연구와 기술보급을 하나의 조직 속에 두어 농업연구와 기술보급이 연계가 이루어지도록 하였다.

농촌지도기구의 변화가 있을 때마다 이러한 교육적 특성과 사업추진 원리를 고수하기 위해 독립적 기구를 유지하려는 입장과, 행정체계 속에 지도기구를 보조기관화 하여 행정의 능률을 증대시키려는 입장이 대립하여 왔다. 농업기술원 말기(1954년)와 농사원이 농촌진흥청으로 개편되기 직전(1961년)에 시군 농촌지도기관을 시군청의 보조기관(교도계 등)으로 편입

시킨 바 있으나, 차기 조직개편 시에는 원상복구를 하는 소모적 현상이 되풀이 되었다. 1962년 농촌진흥청 발족 이후에 시군 농촌지도기관은 교육적 특성을 살려 주곡의 자급과 신선채소의 연중생산 등 이른바 백색혁명을 주도하면서, 우리나라의 농촌지도사업이 세계에서 성공한 사례의 하나로 평가를 등 위상을 확고히 하여 왔다.

그러나, 1998년을 시발로 취약산업으로 인식되는 농업 관련 공공조직에 시군농촌지도기관이 포함되어 적합한 조직평가가 이루어지지 않은 채 대대적인 축소지향적 구조조정이 획일적으로 적용되어 폐지 또는 감축되거나, 시군 농정부서와 통합되는 등 농촌지도기능의 약화를 초래하고 있다. 특히 농정부서와의 통합은 교육적 특성을 중시하여 온 농촌지도기관의 정체성을 변화시키는 큰 요인으로 작용하고 있다.

우리나라의 농촌지도조직체계는 시기별로 다음 그림에서 보는 바와 같이 현재 지방화의 시대로 농촌지도조직이 지방자치단체의 산하조직으로 되어 있다.

그림 2-2. 농촌지도체계의 변천과정

시대	60년대	70년대	80년대	90년대	2000년대
구분	1기(식량증산)		2기(개방화대응)		3기(지방화)
중앙	농촌진흥청발족('62)지도국	지도국, 기술보급국('73)('73공보관실)('78경영관실)		기술지도국('94)→기술지원국('99)	
도	농촌진흥원('62) 3과(서무과, 지도과, 시험과)	지도국신설('70)			지방직화('97)농업기술원('98)
시군	농촌지도소('62) 3계(지도계, 기술계, 개발계)지소설치('63) 3~4읍면 → 전읍면('75)기술담당관제('76)		지소통폐합('89) 2~3과 설치('90)상담소설치('92)		지방직화('97)농업기술센터('98)상담소감축('98)

한국의 농업기술 개발 및 기술보급체계는 시대적으로 농업과 농촌이 담당하여야 할 역할과 기능에 부합되도록 그 조직과 주요 핵심적인 기능이 변천되었다. 1970년대 이전은 한국전쟁 이후 만성적인 식량부족에 시달리면서 쌀 등 식량작물의 생산성 제고를 통한 증산이 핵심과제이었다. 1970년대는 녹색혁명으로 쌀의 지속적인 자급을 이룩한 시기로서, 새마을운동을 농업기술 지도와 보급, 확산의 계기로 삼았다. 1980년대는 이른바 백색혁명을 통해 쌀 이외의 원예작물, 즉 과일과 채소 등의 소득 작물에 대한 생산 확대로 농가소득을 올리고자 매우 다양한 농업기술이 개발, 보급된 시기이다. 1990년대 들어서 농산물 시장 개방을 위한 국제협상에 우리나라가 참여하게 되면서 농업과 농촌의 다원적 기능의 제고로 이를 타개하고자 하는 측면이 강조되었고, 이를 위한 친환경농업과 같은 새로운 분야의 기술개발과 보급이 핵심사업으로 등장하게 되었다.

농업기술개발과 기술보급을 총괄하는 중앙부처인 농촌진흥청은 현재 총 1,856명의 정규직 인력을 운용하고 있다. 이 중 연구직은 1,094명이다. 본부에서 사업을 수행하는 부서는 연구정책국과 농촌지원국, 기술협력국 등이 있으며, 산하에 국립농업과학원, 국립식량과학원, 국립원예특작과학원, 국립축산과학원 등 기능별로 분류된 4개의 연구전문 기관을 두고 있다.

한국의 농업연구개발과 기술보급체계는 다음과 같은 두드러진 특징을 가지고 있다.

첫째, 농업연구기능과 기술보급 기능을 농촌진흥청이 함께 수행함으로써 연구와 기술보급사업이 상호 효율적으로 연계될 수 있도록 하였다. 이를 통해 연구개발 성과의 농가보급, 농가수요의 연구개발 과제 반영이 신속하게 이루어질 수 있도록 하였다.

둘째, 농업행정과 농업기술 지도체계의 분리이다. 농촌진흥청이 초기부터 농림부의 외청으로 독립되어 별도의 인사, 예산관리를 하였다. 도 농촌진흥원, 시·군 농촌지도소 역시 행정기관과 협조하면서 특정 작목 및 지역여건을 고려한 연구개발 및 전문적 지도역할을 수행하는 독립된 기관으로

존재하였다. 1990년대 후반부에 지방의 인력들이 시군 등 행정기관으로 편입되기 이전까지는 인력관리도 분리된 체계를 유지하였다.

셋째, 국가가 주도하는 연구개발 및 기술보급체계를 구성하였다. 전담 정부부처인 농촌진흥청 이외의 기관에서 시행하는 지도사업은 농촌진흥청장과 긴밀히 협조하거나 사전 승인이 필요한 것으로 규정하였다. 농업기술 연구개발과 보급을 위한 예산은 전액 중앙과 지방정부로부터 교부되고 있고, 이는 현재까지도 마찬가지이다.

넷째, 인력의 전문성을 확보하기 위한 노력을 기울였다. 농촌진흥청 발족 당시 3,000명이 넘는 인력이 있었고, 이 중 대졸 이상이 43% 정도로 높은 교육수준의 인력들이 많았다. 지도인력은 1989년 약 8,000명까지 크게 늘었다. 아울러 이들의 전문성 확보를 위해 도에 “농촌지도인력 전문특기화 규정(1974)”, “전문특기화 지침(1989)” 등을 제정하고 전문적 역량에 따라 각급 지도기관에 배치하였다.

다섯째, 농촌지도기관의 지도사업은 매우 다양한 영역에 걸쳐 추진되어 왔다. 농업연구와 기술보급 이외에도 농촌자원 개발 및 생활개선사업이라고 하는 세 가지 축을 중심으로 추진되어 왔다(이성우, 2010: 27). 농촌주민에 대한 계몽과 인적 자원개발, 생활환경에 대한 개선과 같은 사회교육, 삶의 질 향상 프로그램이 필요하였기 때문이다.

제 3 장

주요 활동 내용 및 성과

1. 주요 자문내용

한국과 파라과이의 기본 농업 현황의 차이를 감안해야 함을 공유하였다. 국토면적은 우리나라 보다 파라과이가 4배 넓고 농경지의 경우 18.2배이다. 반면에 인구는 한국이 파라과이에 비해 7.5배 많다. 농촌인구 비중이 한국은 18%이지만, 파라과이의 경우 40%였다. 농가수는 한국에 비해 1/3~1/4 수준이었다. 비록 우리보다 전반적인 경지규모가 크지만 활용도가 낮고, 대규모 농가와 소규모 농가간의 격차가 심하였다. 이에 더하여 파라과이 농업인의 대다수가 교육수준이 낮고, 신기술 접근성이 낮는데 비해 한국의 경우 높은 교육수준과 각종 교육과 신기술에 대한 접근성이 높다는 차이가 있었다.

표 3-1. 파라과이와 한국의 농업 현황 차이

	파라과이	한국
국토면적 (1000 km ²)	406	100
농지면적	310	17
인구 (천명)	6,687	50,220
농촌인구비중	40%	18%
농업인구비중	12%	5%
농가수 (천호)	289	1,142
>1ha	5.1%	64.2%
1~5ha	34.9%	31.4%
5~10ha	22.8%	2.3%
<10ha	37.2%	0.5%
평균 규모	over 20	1.5

파라과이의 소농을 위한 농업연구와 기술보급체계에 관한 문제점 개선을 위하여 다음과 같은 내용의 자문이 이루어졌다.

첫째, 파라과이 농업분야 R&D에 대한 정부 투자 재원의 안정적 확보와 투자 확대 부문이다. IPTA의 경우 예산확보의 안정성이 보장되지 않기 때문에 중장기 기본연구에 충실하기 어려운 상황이다. 농업분야의 연구개발은 농축산물의 계절성 및 장기적 사육 등으로 단기간에 그 성과가 나타나기 어렵기 때문에, 중장기적인 안목으로 안정적으로 재원을 확보하여 농업기술 연구개발을 꾸준히 시행하는 것이 꼭 필요하다. 그리고 파라과이는 과학기술에의 투자가 GDP의 0.08%에 불과하여 연구개발을 위한 투자에 매우 인색하다. IPTA를 비롯한 농축산부 산하 정부기구들이 예산의 상당부분을 수수료 수입 등으로 스스로 확보해 나가야 하는 상황에서 기본적, 중장기 연구를 통한 기술개발에 인력과 장비 등을 투입하기는 어려울 것이다. 따라서 대다수 소농을 위한 연구개발과 개발성과의 보급에 충실하도록 충분한 정부예산의 지원이 있어야 할 것이다.

둘째, 연구 개발된 농업기술이 효율적으로 보급될 수 있도록 상호 연계할 수 있는 농업연구-기술보급의 연계가 이루어져야 한다. 파라과이 농업기술 개발과 보급이 효율적으로 연계하기 위해서는 한국의 농촌진흥청 및 관련 기관 사이에 이루어진 기능적 통합과 연계 방안을 참고로 할 필요가 있다. 단기적으로는 IPTA의 지역 센터와 농장을 중심으로 이루어진 농업기술 연구개발의 성과가 DEAg의 CDA와 ALAT의 지도요원을 통해 농가에 보급될 수 있는 기관간 협력체계 구축을 추진하여야 한다. 이를 위해서는 IPTA에서는 농업연구 평가시스템을 개선하여 기술보급이 이루어질 수 있도록 보다 현장 지향적인 연구결과가 도출될 수 있도록 농업연구 성과 평가시스템을 개선하여야 하여야 할 것이다. 또한 DEAg에서는 IPTA 연구과제 선정과 연구과정에 적극적으로 참여하여 IPTA의 연구결과가 기술보급 현장에 적용될 수 있도록 과제선정이나 평가에 적극 참여할 수 있는 시스템을 개발하여야 할 것이다. 또한 연구직과 지도직 상호간에 교환근무를 확대하여 농업연구와 기술보급간의 연계가 이루어지도록 하여야 할 것이다. 그리고 장기적으로는 IPTA의 기술이전 담당부서와 DEAg 산하조직에 대한 업무분석을 통해 조직적으로 연계할 수 있도록 인력조정과 부서개편 등을 추진할 필요가 있다.

셋째, 농업기술의 변화속도는 매우 빠르게 진행되고 있어서, 새롭게 개발된 농업기술에 대하여 일선의 지도직에게 정기적으로 교육할 수 있는 교육시스템을 개발하여야 한다. 한국의 농촌진흥청에서는 개발된 농업기술이 지도직에게 전파될 수 있도록 ‘농촌인적자원개발센터’를 두어 정기적으로 학습할 수 있도록 하고 있다. 파라과이 IPTA에서도 개발된 농업기술을 DEAg 지도요원이 학습할 수 있도록 교육담당 전담부서가 설립되는 것이 필요하다.

넷째, 종합적인 기술보급체계 구축부문이다. 한국은 농업기술 개발 및 지도체계가 구축될 당시 매우 가난한 농업국가로서 농업 생산성 제고를 통한 농업 발전 뿐만 아니라 농촌지역의 교육, 보건의료, 인프라 등 기초수요(basic needs) 충족을 위한 등 전반적인 개발의 필요성이 높았다. 따라서 농

업기술지도와 농촌개발을 종합적으로 수행하는 농촌개발요원을 마을에 주재시키는 등 종합지도체계를 시행하였다. 한국의 이러한 경험을 바탕으로, 특히 파라과이의 낙후지역을 대상으로 농업기술 보급과 농촌개발 계획수립 및 사업추진을 종합적으로 추진할 수 있는 요원들을 배치하는 방안을 모색하는 것이 바람직하다. 농민의 경제적, 사회적 여건 개선을 동시에 추진할 수 있도록 DEAg의 조직 및 업무 확장, 기술지도 및 보급요원의 역할 재정립 등을 통해 종합적인 기술보급체계로 발전시키는 것이 필요하다고 판단한다.

다섯째, 효과적인 농업기술개발 및 보급체계의 연계 시스템을 구축하는 이유는 농업기술혁신시스템(Agricultural Knowledge and Innovation System)을 구축하기 위해서이다. 즉 농업연구개발, 농촌지도시스템, 농업교육시스템에서 지식의 혁신이 이루어지도록 하기 위해서이다. 새로운 농업 지식은 연구기관에서의 좋은 연구성과를 내는 것도 중요하지만, 무엇보다 중요한 것은 보고서화된 공식적 기술은 아니지만, 농업인들이 현장에서 활용하고 있는 ‘암묵적 지식’(tacit knowledge)를 ‘표현적 지식’(explicit knowledge)으로 전환하는 것이다. 이를 위해서는 농업연구기능, 기술보급기능, 농업교육기능의 효과적인 연계시스템이 구축되어야 한다. 또한 연계시스템을 구축하기 위해서는 정부정책이나 협력체계가 구축되어야 할 것이다.

2. 주요 활동 모니터링 결과

공동워크숍 동의를 강의는 스페인어로 전 과정이 진행되고, 한국어 강의 자료 또한 스페인어 번역본이 제공되어 연수생들의 참여도가 높고 심도 있는 질의응답 및 토론이 가능했다. 2015 KAPEX 파라과이의 주제인 ‘농업기술 보급체계’에 초점을 둔 연수과정을 기획하여 관련 실무자들이 연수생으로 다수 참여하였으며, 강의에 대한 관심도 및 집중도가 높아 강의 위주의

연수 보다는 질의응답 및 의견 공유가 매우 활발하게 진행되었다.

현장학습은 파라과이 농목축부와 긴밀한 협력 관계에 있는 KOPIA 센터를 방문하여 종자 개량 및 기술 보급 체계에 대한 소개가 있었으며, 향후 파라과이와의 농업기술 협력 방안 및 지역농가 방문을 통한 기술 전수 프로그램의 기회를 논의 할 수 있는 기회가 있었다.

연수생 대부분이 영어로 의사소통이 불가능 하여 영어 강의를 지양하고, 한국인 강사의 경우 또한 한-서 통역을 제공하여 연수생들의 이해도를 높였다. 현지 거주하는 통역 전문가를(스페인어, 과라니어 등) 채용하여 현장 학습 시에도 동행하는 등 질의응답 내용이 다양하고 심도 있게 다루어 질 수 있었으며 기타 의사소통 또한 매우 원활했다.

파라과이의 경우 농업기술개발과 기술 보급 조직이 분리되어 있어, 농업 기술보급체계가 유기적으로 이루어지지 않아 정책 수행이 비효율적 이었으나, 이번 연수를 통해 기술 보급 조직과 보급 조직이 처음으로 한 자리에 모여 의미 있는 논의의 장을 형성 할 수 있었다.

초청연수 시 작성했던 액션 플랜을 바탕으로, 현지 연수 과정에서 논의되었던 내용을 심화 발전시킨 액션 플랜을 수립함으로써 향후 실효성이 기대된다.

제4 장

공동조사 추진관련 제안 및 향후 일정

1. 추가 공동조사 제안

파라과이 ODA 사업은 농업기술 보급체계 개선을 통한 농업 생산성 및 농가소득 향상을 목적으로 농업기술 개발 및 이전을 위한 인프라 구축과 연구-지도 연계를 위한 시스템 개선과 관련된 사업을 제안할 수 있다. 최근 10년간 파라과이 농업 정책과 농촌개발 조직 변동으로 인해 가축농에 대한 기술지원 및 보급 체계가 개선될 필요하므로, 생산기술의 개선 뿐 아니라 농업연구-지도 시스템 개선과 이를 위한 지속적인 농업 및 농촌인력 육성을 목적으로 한 장기적인 ODA 사업이 필요하다.

이는 파라과이 농업기술연구소(IPTA)와 농업축산부 농업기술보급국(DAEg) 그리고 개인, 민간기업, 공공기관과 아순시온 국립대학 농학부(FCA) 간의 농촌지도 관련 연구와 그 결과의 지속적인 협력교류를 위한 연계성을 증진시키고 학생들의 사회적 책임의식을 고취시키기 위해 설립된 파라과이 대학농촌지도부(DEU: Direccion de Extension Universitaria (Servicio a la comunidad) 등의 전문가 협력을 통해 농촌지도 서비스 네트워크가 구축되고 강화될 수 있는 연구-지도 연계 시스템이 구축될 수 있도록

록 해야 한다.

사업 우선 추진 지역으로는 기술보급이 용이하고 사업효과성이 높은 지역을 선정해야 한다. 아순시온을 중심으로 기술 지원 수혜농민 수가 많고, DEAg의 농축산업발전센터(CDA)가 운영되고 있어 기술 인력이 활용 가능한 지역을 중심으로 검토할 필요가 있다. 특히 산 빼드로, 폰셉시온, 끼아과수 등 지역은 농가수가 많으나 빈곤율이 높은 지역으로 농가 기술보급지원 시 우선적으로 고려할 필요가 있다. 각 지역 중심의 CDA 뿐 아니라 IPTA의 지역연구센터 그리고 농업학교 등 농업기술 및 보급과 관련된 인적·물적 자원이 연계할 수 있도록 해야 할 것이다.

2. 향후 ODA 시범 프로젝트 세부 내용

○ 농업기술 개발 및 보급을 위한 교육 인프라 개선

보다 효과적인 농업기술 지도 및 보급을 위해 DEAg의 농축산업발전센터(CDA)가 운영 가능한 지역을 중심으로 농업기술 지도 인프라 (소농 교육훈련센터 건립, 오토바이 등 장비) 및 각종 교육 기자재를 개선해야 한다. 또한, 연구개발 수행 기관과 공공 및 민간 조직의 협력 활성화 지원과 농촌 공동체 내 위원회 또는 협동조합 등의 조직이 구성되고 활성화 될 수 있도록 지원할 필요가 있다.

○ 기술보급 교육 프로그램 개발

연구에서 개발된 기술이 영농현장에 효과적으로 보급될 수 있도록 하기 위해서는 품목별 혹은 영역별 기술보급 프로그램이 개발되어야 한다. 이 프로그램은 지도사를 위한 교육 뿐만 아니라, 선진농가들도 교육을 받을 수 있도록 현장에 농업인의 수요를 반영한 다양한 교육프로그램이 개발되어야 한다. 소규모 가족농의 경쟁력 강화를 위한 조직화 및 농업·농촌지도사업

프로그램 공동 개발(IPTA-DEAg-소규모 농가 공동 참여)이 필요하다. 특히, 농가가 실제 농업생산 현장에 적용할 수 있고 농가로부터의 수요가 있는 현장 실용기술 이전이 필요하기 때문에 중소규모 농가의 수요와 기술적용가능성을 파악하는 사전 조사가 필요하다.

○ 전문 지도사 육성

파라과이 농업기술보급국은 21개 지역에 농축산발전센터(CDA)가 설치되어 있으나 20만명 이상의 소농가에 농업기술을 보급하는 전문 인력이 매우 부족한 실정으로 지도사 육성이 시급하다. 2015년 기준, 농업기술 보급을 위한 기술전문가 및 행정인력 653명으로, 우수한 인력을 채용하기 위해서는 농업·농촌 분야 지도사에 대한 경제적 인센티브 지급 방안이 마련되어야 한다. 일반적으로 농업지도사 1인당 120농가를 책임지고 있으며, 월 급여가 460~500달러로 낮은 수준이기 때문에 전문가 확보에 어려움이 있다. 따라서, 파라과이 농축산부 농업기술보급국 (DEAg) 및 농업기술연구소 (IPTA)의 관련 담당자 역량 강화를 위한 교육 및 컨설팅 제공 (한국 및 타 선진국의 사례 공유)이 필요하며 지역단위의 소농 농촌지도자 양성 및 전문가 교육 실시하고, IPTA의 농업기술 개발(연구) 역량과 DEAg의 농업지도 역량 강화와 연구-지도 시스템 개선을 위한 한국전문가를 파견해야 한다.